Bonsai

TODAY

JULY - AUGUST 89

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$7.50
$9.00 in Canada

FIVE NEEDLE PINE
PINUS PARVIFLORA PENTAPHYLLA
TWIN TRUNK STYLE

air layering • masahiko kimura styles "the dragon" • bonsai basics
reducing needle size • creating deadwood • styling white pine
styling needle juniper • gallery of bonsai masterpieces

EDITORIAL

In the West we write from left to right, whereas in Japan writing progresses from right to left. This difference is reflected in tendencies in the styling of bonsai. Look at slanting style, literati and semi-cascades: how often do you see trees leaning toward the left in North America? It is interesting to take a tree with no obvious front, display it before a group and see that the left to right orientation is usually strongly preferred.

To some degree this left to right propensity may inhibit the readability of this magazine. Let me explain. Many of the articles originated in Japan and quite naturally the associated art work follows a right to left sequence. Photographs we can move around, but drawings with multiple sketches of step-by-step methods are much more difficult to reposition.

Where we think it helps clarify the sequence, we have added arrows. But, you may have to trace the arrows backwards to the source to locate the starting point. I hope these few moments of detective work are not too distracting.

Perhaps this is a good opportunity to tell you a little more about the primary source of the material for *BONSAI TODAY.* Many of the articles are translations of articles that originally appeared in *CONTEMPORARY BONSAI*, the leading Japanese bonsai magazine, published by Kindai Shuppan in Kyoto. With the granting of translation rights, we and our associates in Valencia also received the original color separations which permits us to print the striking photographs which illustrate each of our issues.

Bringing you the latest in bonsai technique and inspiration from Japan is not however our only objective. Bonsai has been taken to heart in the West. Techniques have been adapted to our climate and applied to native material. Bonsai artists in this country are developing distinctive styles, reflecting Western aesthetics. It is our objective to bring to you the latest in bonsai developments in the Western world as well.

We encourage your active participation and we solicit your input.

THE EDITOR

READER'S PAGE

In this column, BONSAI TODAY will present news of general interest to bonsai enthusiasts as well as answer questions that you, the reader, may have about bonsai. If you have a question or information that you would like to share with others or if your club is planning a special event, please write the editor.

WISTERIA

I have tried just about everything I can think of to get my wisteria bonsai to bloom and have had no success. Perhaps your readers might have some suggestions.

I read that in order to stimulate formation of flower buds, the roots of wisteria should not be touched the prior season. In another article, I read that blooming would only occur if the plant were subject to trauma - and certainly root pruning is traumatic. So, I have left several plants alone and lightly root pruned others, but there was no recognizable difference.

Another source advised that the roots should be kept very moist and that the best approach was to keep the pot in a shallow tray of water for a full growing season. Not only would plenty of moisture be provided, but also the roots would be kept relatively cool. This didn't work either.

I tried withholding high nitrogen fertilizer and applying only superphosphate, but still no flower buds.

Also, realizing that wisteria blooms from second year growth, I have been careful not to prune new growth for a full two years. All that resulted was a pretty shabby looking bonsai.

Since wisteria in their native habitat tend to grow on the side of mountains, I was careful to give the foliage full sun, but provided a shield to keep the pot shaded. No luck.

I have tried all these things without success. I even got quite frustrated last year, and provided one plant some extra trauma, as one reference suggested, by beating on it with my garden hose. Although the wisteria did not respond, I think I gained a little respect.

Do I have to move to Southern California to have flowering wisteria?

Should you decide to publish this, please do not use my name.

Although you have not met with success, your willingness to try different approaches is terrific. We all have a lesson to learn from your persistence. Growing bonsai is not cook book activity; we only learn what is best through trial and error.

Who has got some good advice? Let's help this reader out. Write the editor with your suggestions. We'll report the answers right here in a future issue.

LEU BOTANICAL GARDENS

While vacationing in Florida recently, I visited the Harry P. Leu Botanical Gardens at 1730 North Forest Road in Orlando, Florida. This magnificent 55-acre botanical garden is alive with show stopping camellias, azaleas, dogwoods, roses and orchids.

In the Garden House, The Central Florida Bonsai Club holds monthly meetings, featuring classes and demonstrations as well as lectures. Members come from a fifty mile radius to enjoy special events like the one recently held to introduce the California artist Ben Oki. A three hour show by Mr. Oki thrilled and entertained the packed house. Classes are open to the public in the art of bonsai.

Information is available by calling 407 849-2960. For the bonsai calendar, call 407 699-1291.

Ruth Ann Hastings

MOSS

I recently purchased a bonsai and in a few weeks the moss turned brown and died. What did I do wrong?

Probably nothing. Although your bonsai may thrive in full sun, most mosses prefer to grow in a shady location.

It is best to just replace it. Look for a fine textured thin moss, best described as looking and feeling like green velvet. Moss that is already growing in full sun is best; it will last longer on your bonsai.

Scrape most of the soil off the back, until just before the pieces crumble; soak the moss in water a few minutes to make it more pliable and also to remove remaining soil particles. Flatten the moss further by lightly pounding on it with the edge of a plate as you would a veal cutlet. Then apply it to the surface. Don't feel as is if you have to cover every last square inch. Your mossy surface is now restored.

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Bonsai
TODAY

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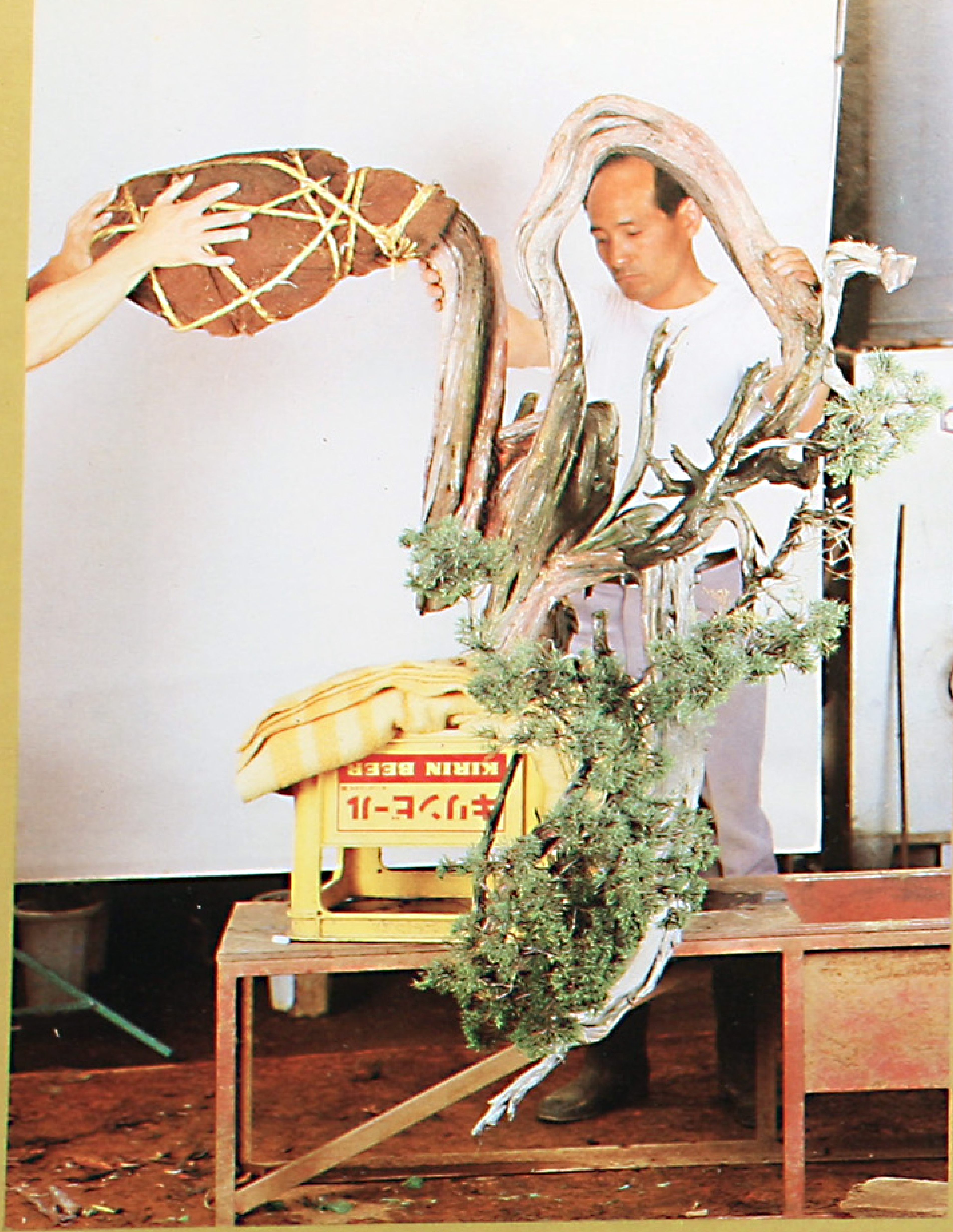
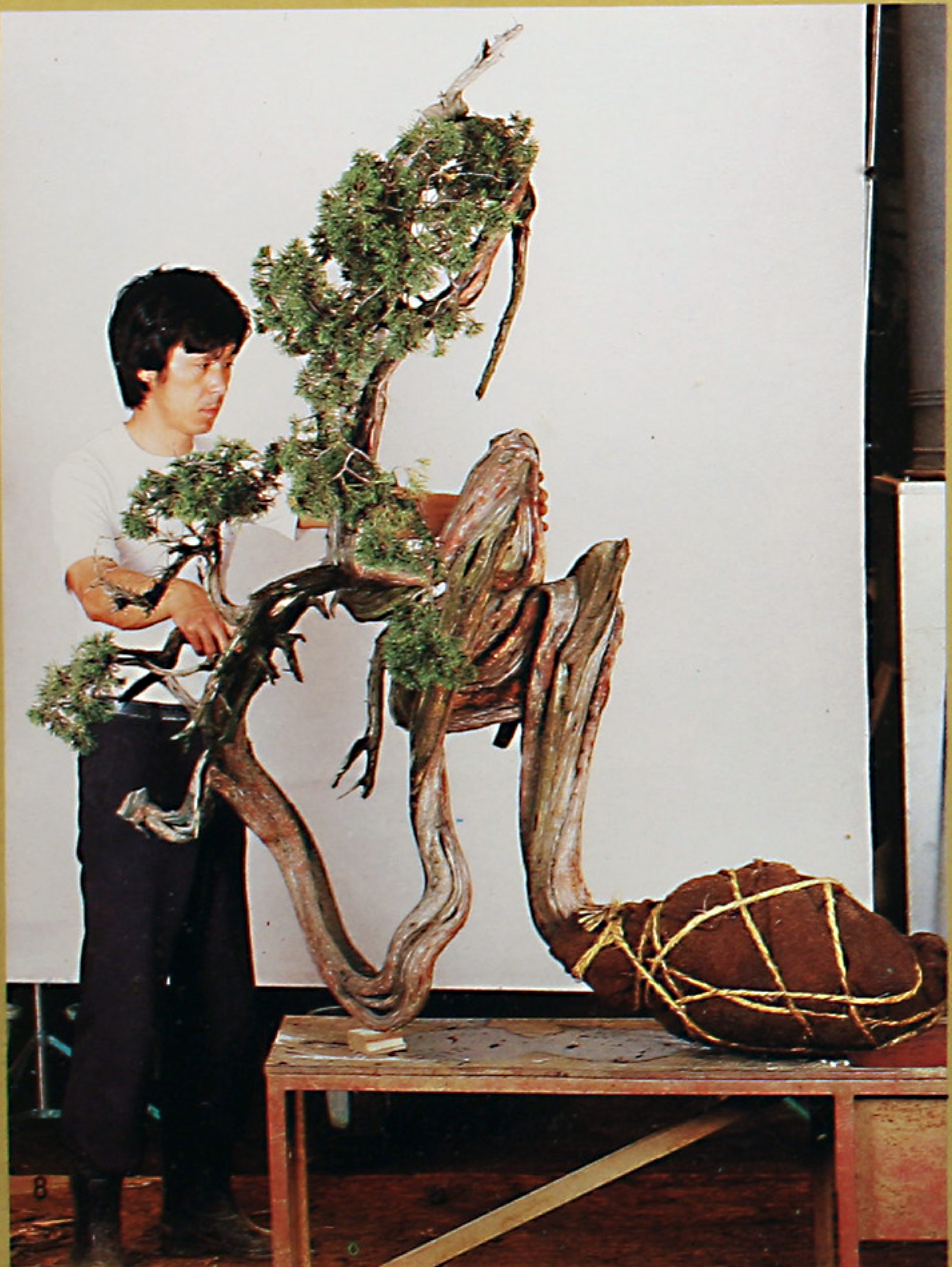
The Dragon

Masahiko Kimura



This was the tree's position on the mountain.

This was to have been its position when converted into a Bonsai. But the design is poor.



When, on June 6, 1984, Mr. Kimura first saw this Juniperus chinensis being lowered from the truck that had brought it from northern Japan to his workshop, he thought that it presented an even more difficult challenge than he had been led to believe.

It was almost six feet long! It looked like a flying dragon with its tongues of fire. Anything but a tree good for bonsai.

Since it had been collected from nature 10 years before, nobody had dared shape and design it, and it had simply been planted as an ornamental tree in a garden.

But now the challenge was there. What can be done with material that is only one-dimensional (long) and that has only 10% of its mass as foliage?

After the initial surprise at seeing the tree, the first step was to observe each part of the trunk carefully, in all positions.

It was very difficult material; it was full of constraints. The word constraints is used in Bonsai to refer to the curves of the trunk, branches, weathered wood, etc., that cannot be modified by restyling techniques; they are characteristics that the artist is constrained to accept in the design process, [i.e., design constraints].

Well, the constraints of this tree were its curves, the weathered wood that already existed, and the fact that the foliage was only at the apex, quite far from the roots.

From these characteristics of the tree, it seems that it probably lived on the side of a cliff, in a very cold region.

What was really complicated about the design of this tree was the challenge of preserving its natural appearance. Far from the mountain of its origin, its proportions seemed grotesque, shocking, and its length unnecessary.

In Bonsai, the artist should suggest through the tree — his work — the rest of the elements of a landscape.

Often the design of a Bonsai is no more than intuitive. The creative process consists of imagining the final appearance that the finished work will convey to the viewer.

Technique must be applied later,

The ideal position

after one already has an idea in mind as to the future design. It is always the means and not the end.

Since this was unusual material, one had to create a sense of distinctive beauty, departing from the classic design principles of the art of Bonsai.

After observing the tree closely, Mr.Kimura thought that the central part was the most attractive, where the tree twists on itself and then falls in a cascade.

But to make such a design viable, the root ball would have to be up in the air.

Most bonsai artists would dismiss this planting position without further ado. Not Kimura!

To attain this planting position, there were only two possible solutions: first, layer the tree to obtain roots where we want them; but this would be too slow a process, from two to three years. The second method: to move the roots to the desired location in some fashion.

The second option was not possible until now, but Mr. Kimura has developed a new and unusual technique that will be revealed in these pages.

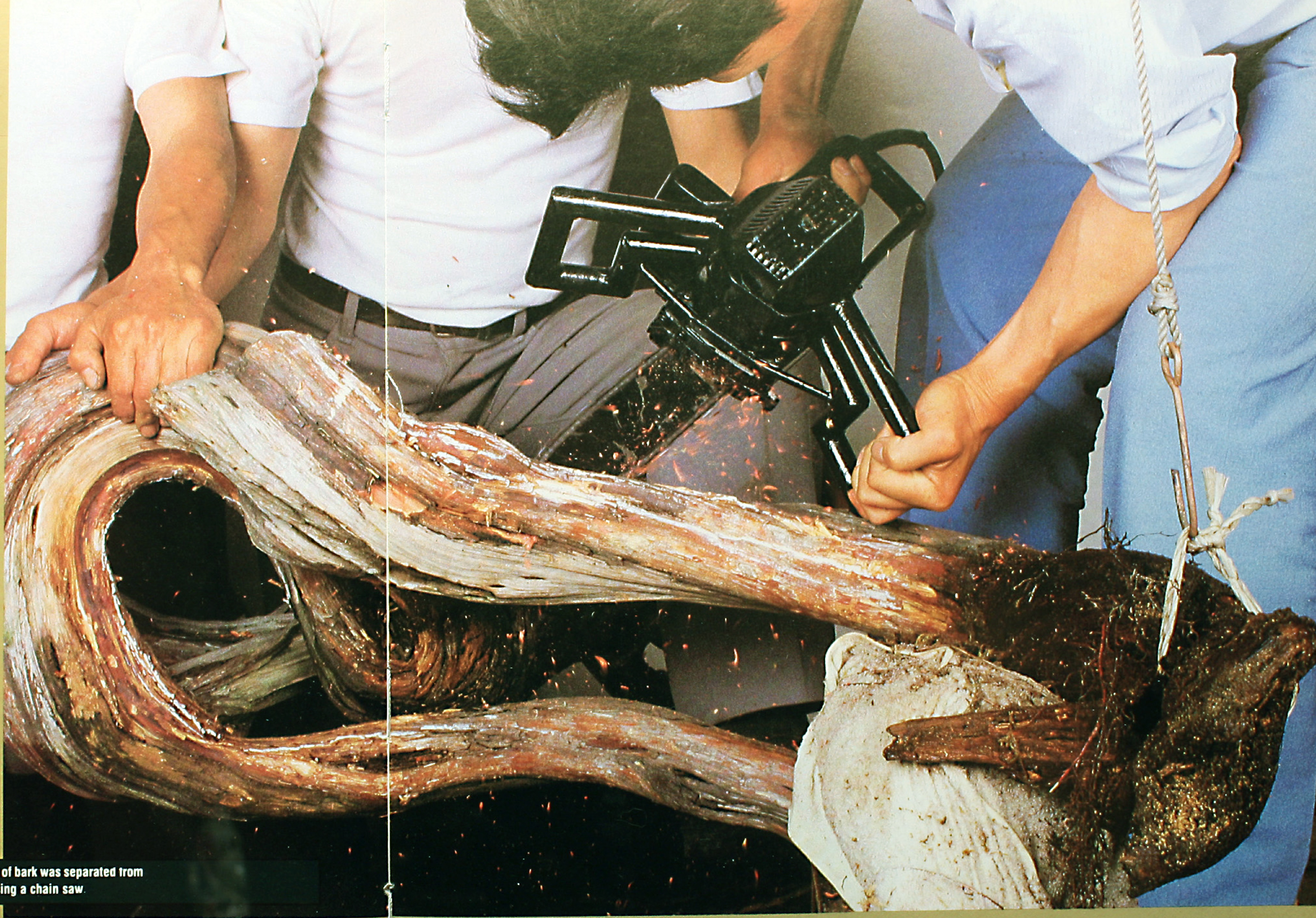
The main problem in moving the roots to the desired location was that the thickness of the trunk did not permit bending it. But the volume of foliage was just 10% compared with the thickness of the trunk; so the logical question would be: do we really need all that trunk? The answer is, no; what is important is that the needles receive enough sap from the roots, that is, the quality of the vessels that conduct the sap, and not the quantity; besides, if it had so few needles, probably many of the vessels were not really functional.

Therefore, theoretically, we could reduce the volume of the trunk.

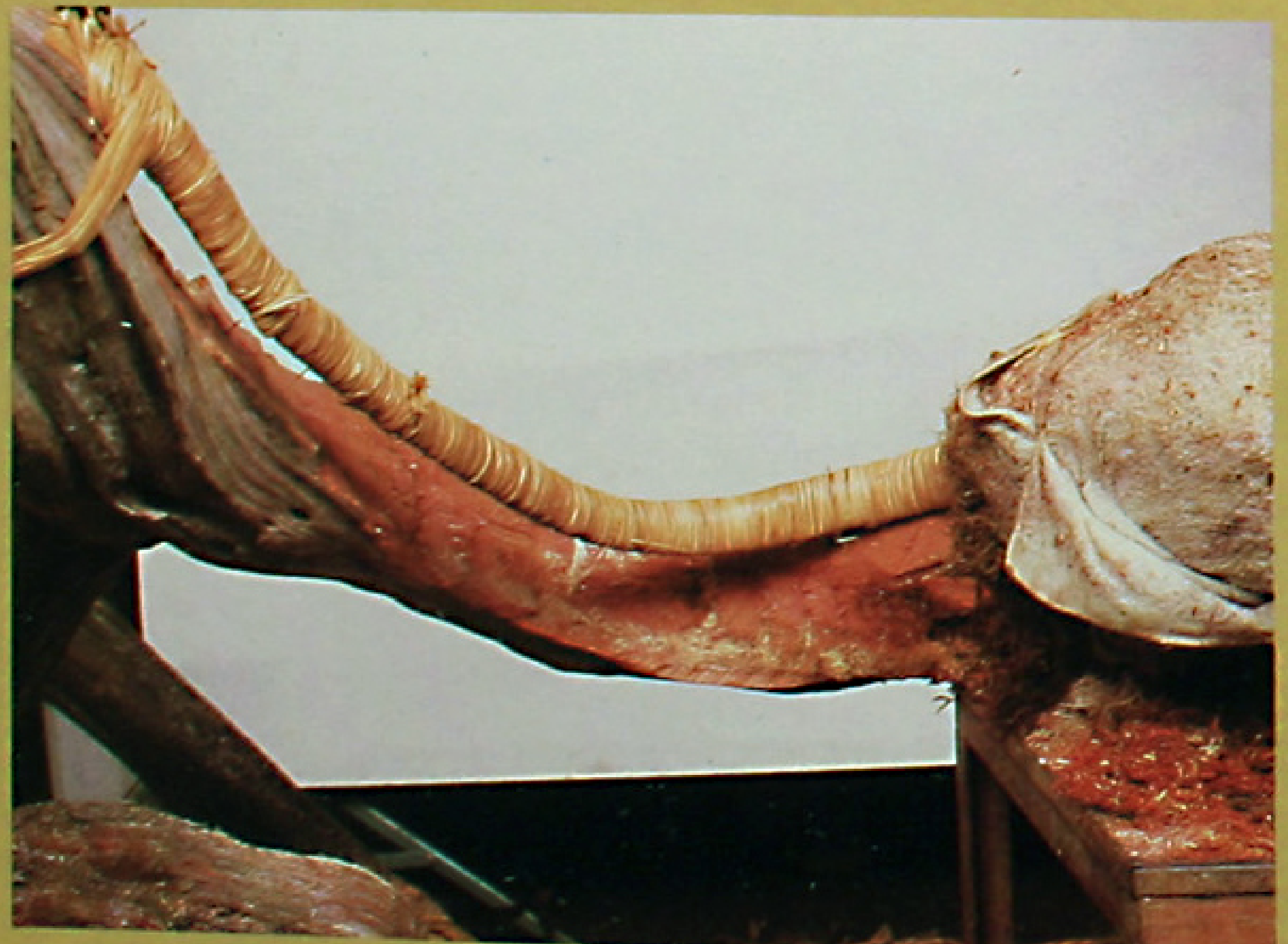
Following this reasoning, Mr. Kimura decided to risk it, separating a piece of bark and wood that would contain enough functioning sap vessels [in both the xylem and the phloem].

With the help of a power saw, he created a vein of living tissue just over one inch wide and about one quarter inch thick!

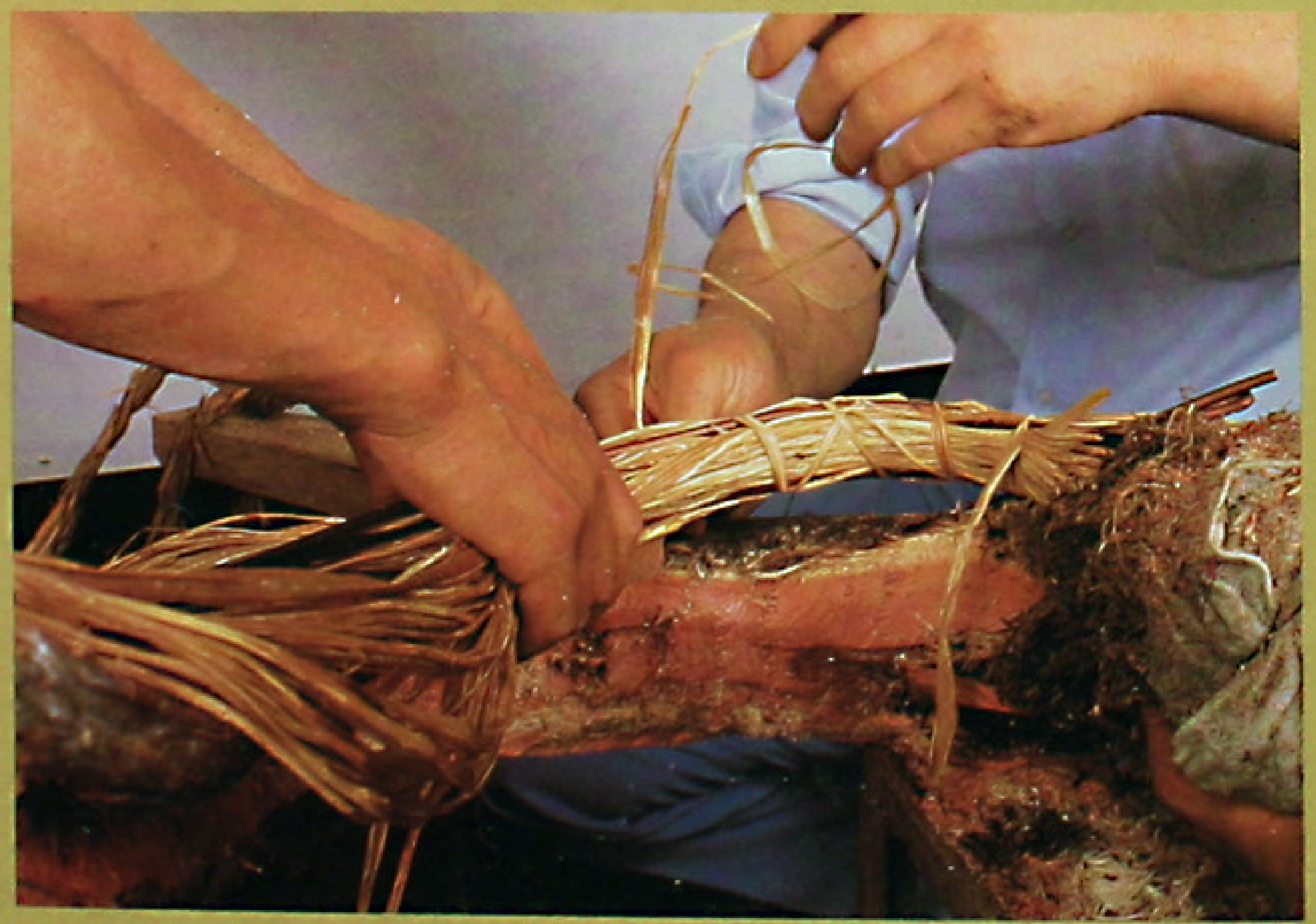
This vein connected the roots to the rest of the tree.



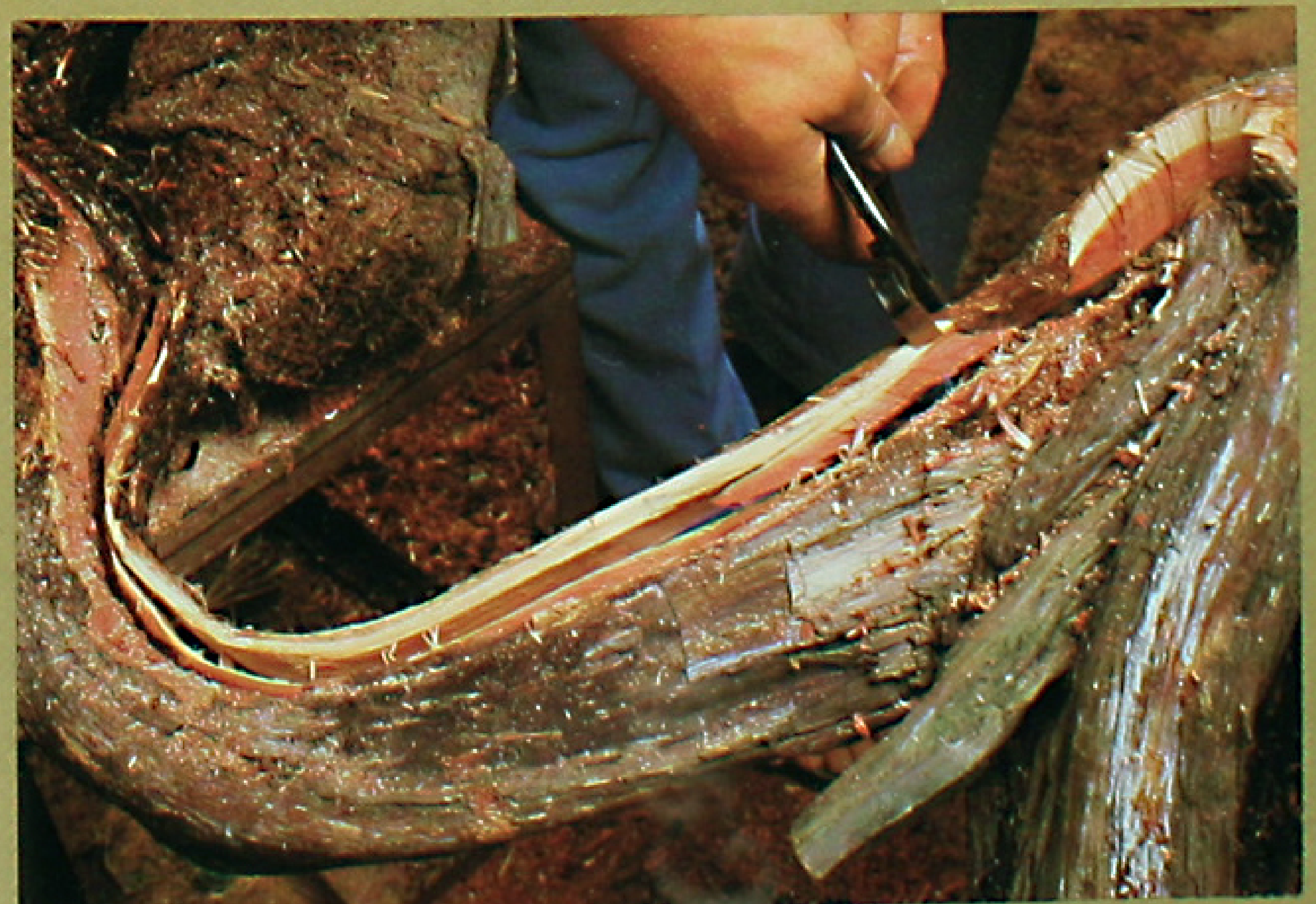
The living vein of bark was separated from the trunk by using a chain saw.



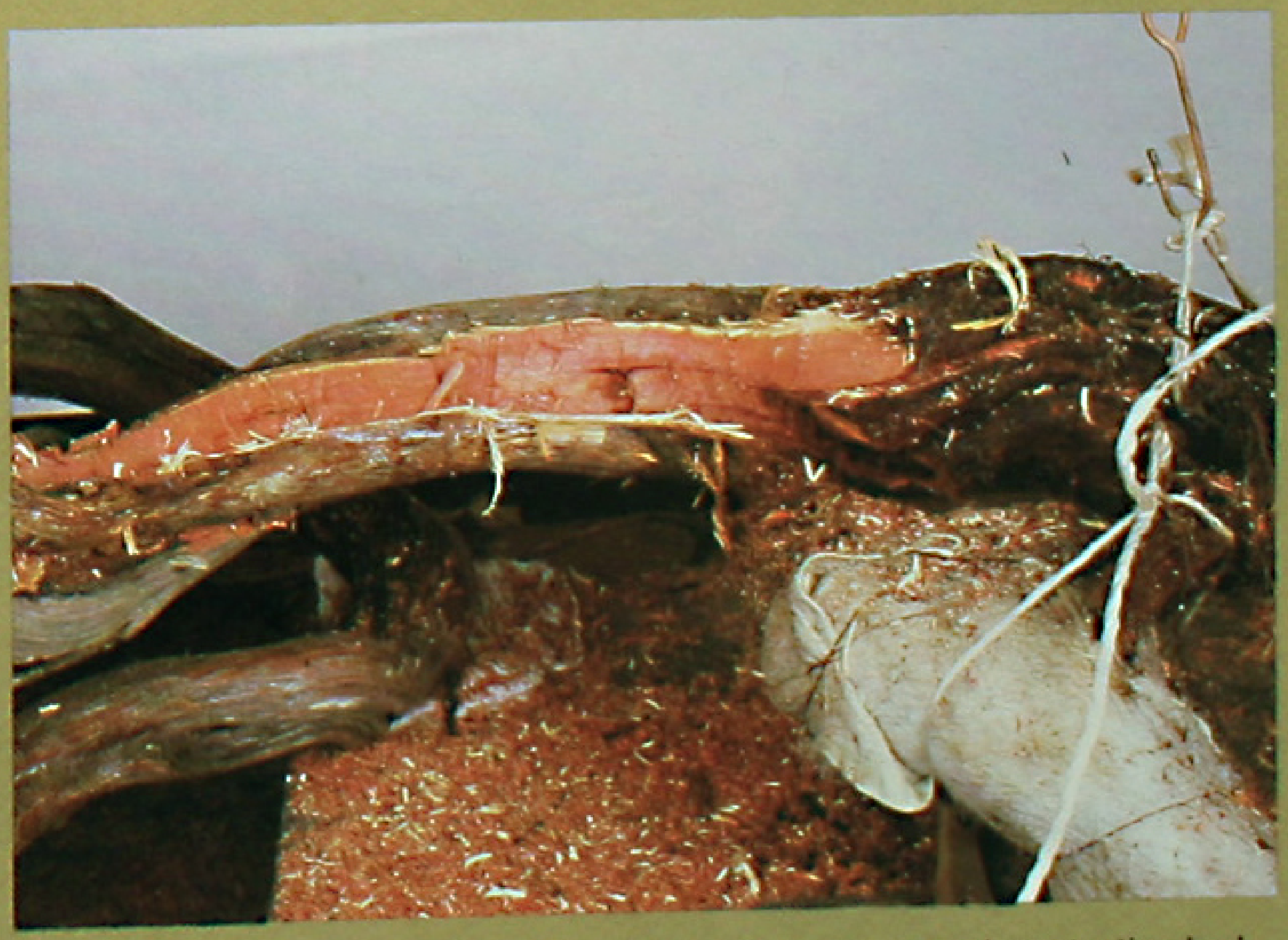
Appearance of the trunk prior to cutting the vein. It will be about one inch wide and one quarter inch thick.



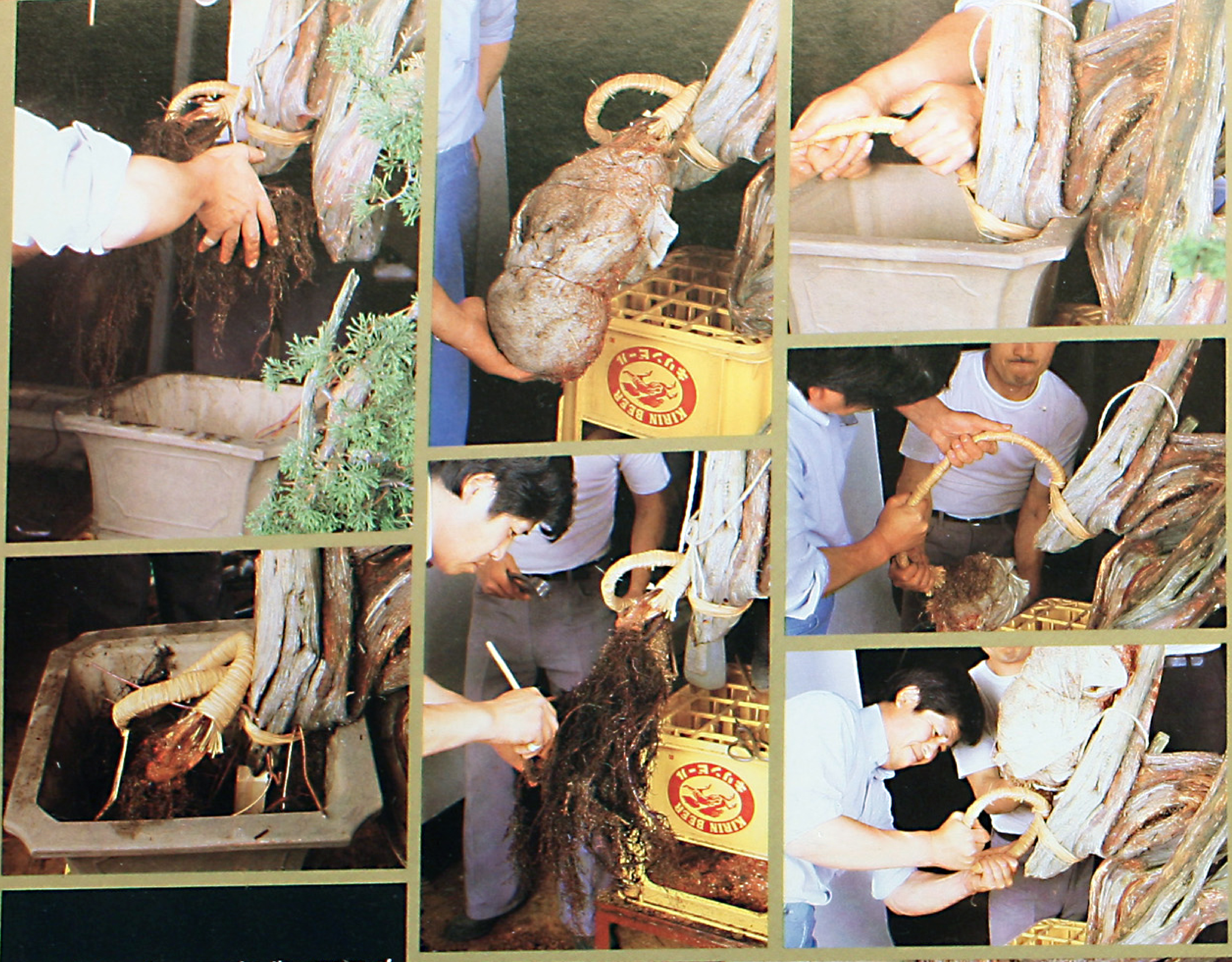
Once cut, we separate the vein from the part of the trunk to which it had been attached.



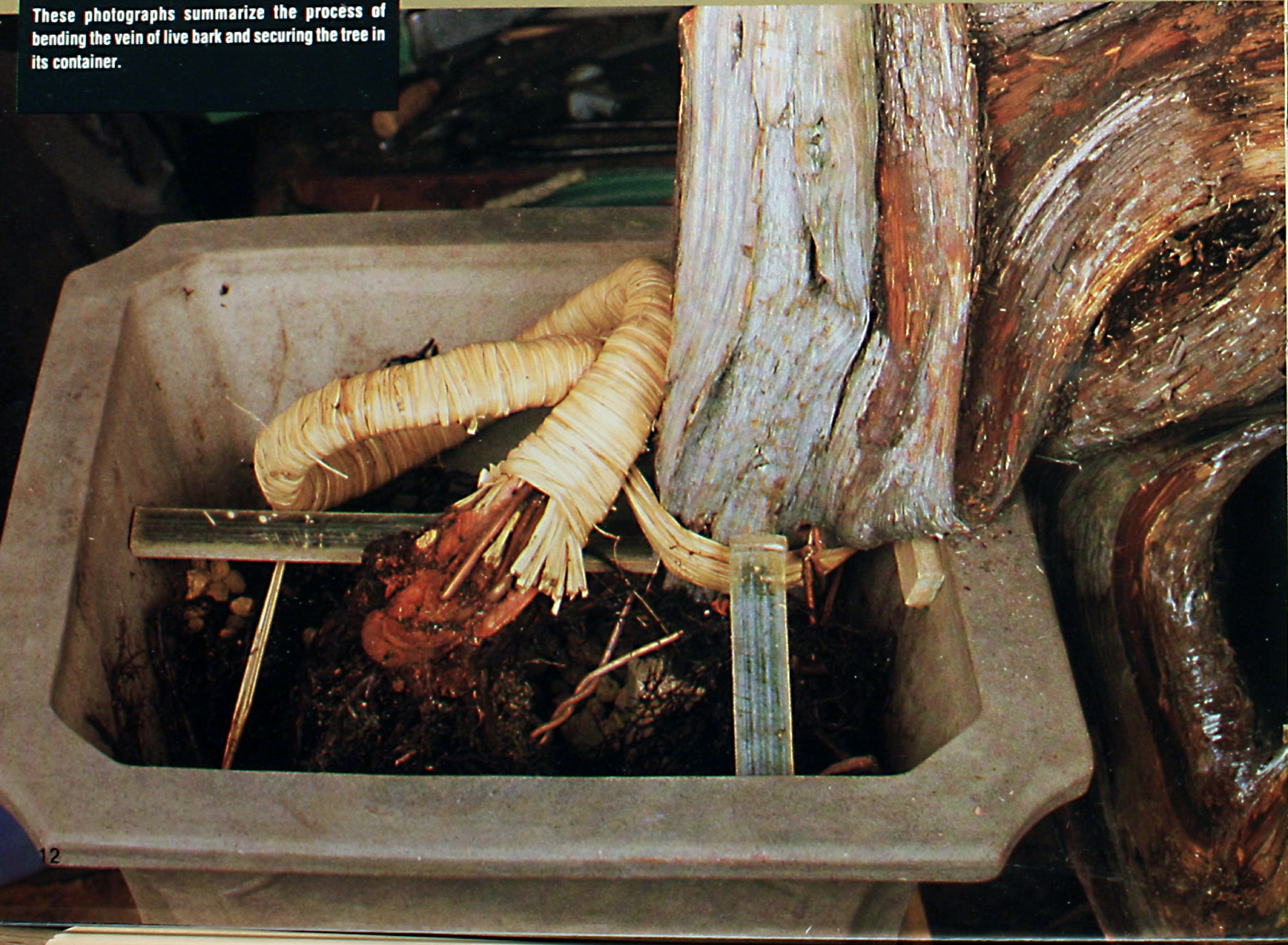
Wrapping the vein with raffia

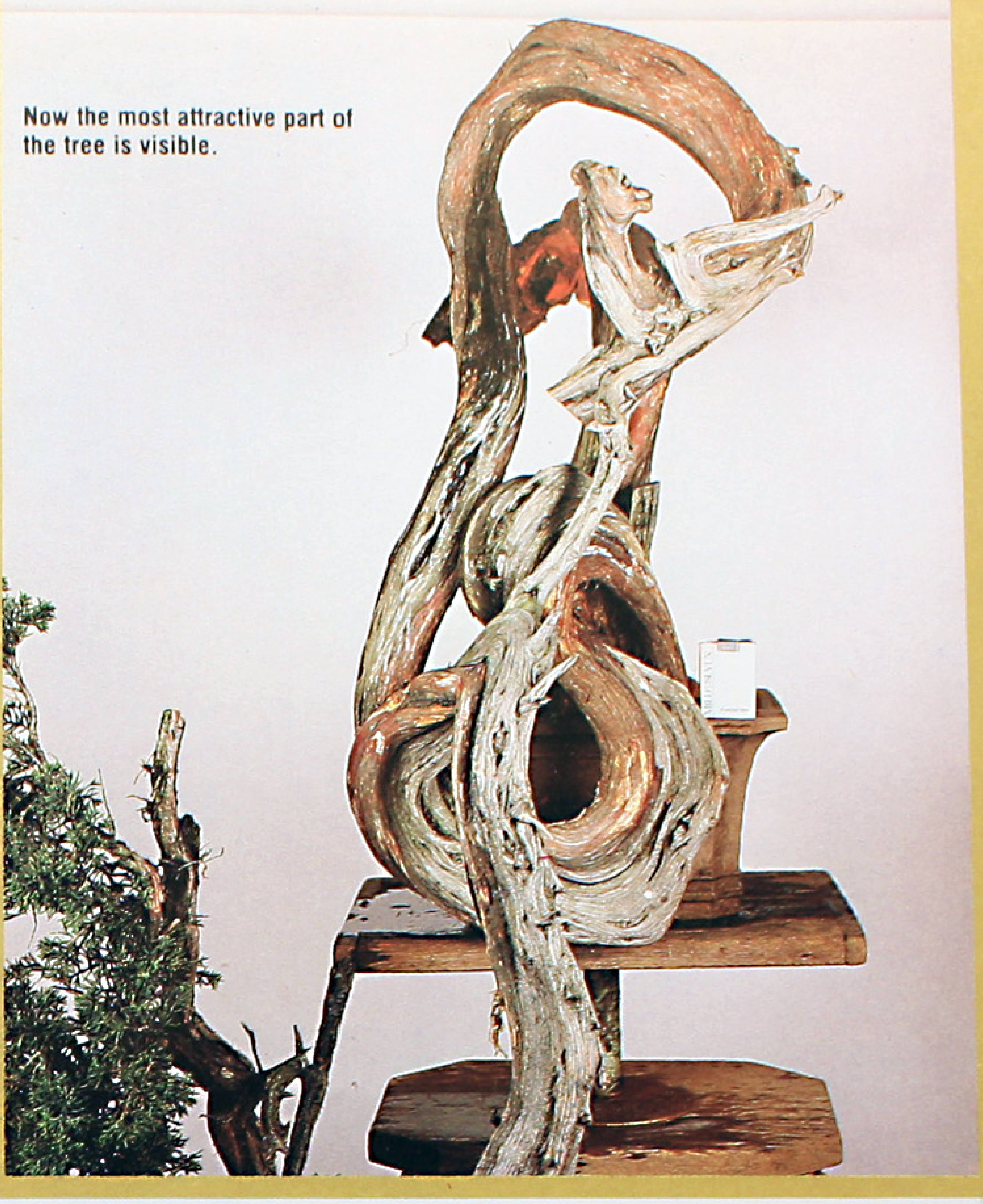


Here is the vein wrapped in raffia which acted as a second, protective bark.



These photographs summarize the process of bending the vein of live bark and securing the tree in its container.





Now the most attractive part of the tree is visible.

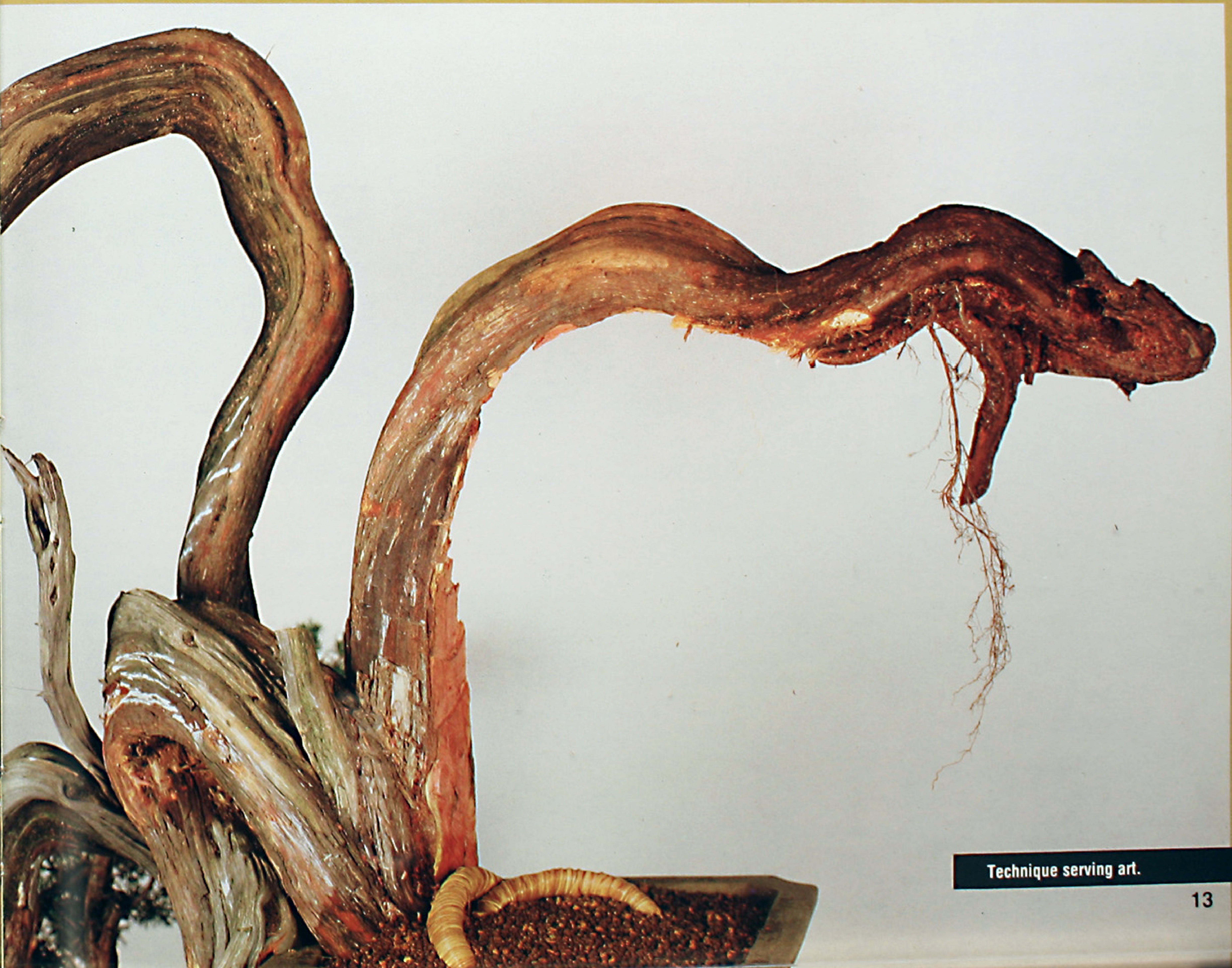
To avoid any future problems (rot, etc.) the vein was wrapped with raffia as if it were a second, protective bark.

The most complicated part technically was complete. Now, just by coiling the vein in the container, the tree would be in the desired position. To help bend it, a number of wires were placed over the raffia lengthwise, and they in turn were wrapped in raffia; in this way, the coil would stay in position.

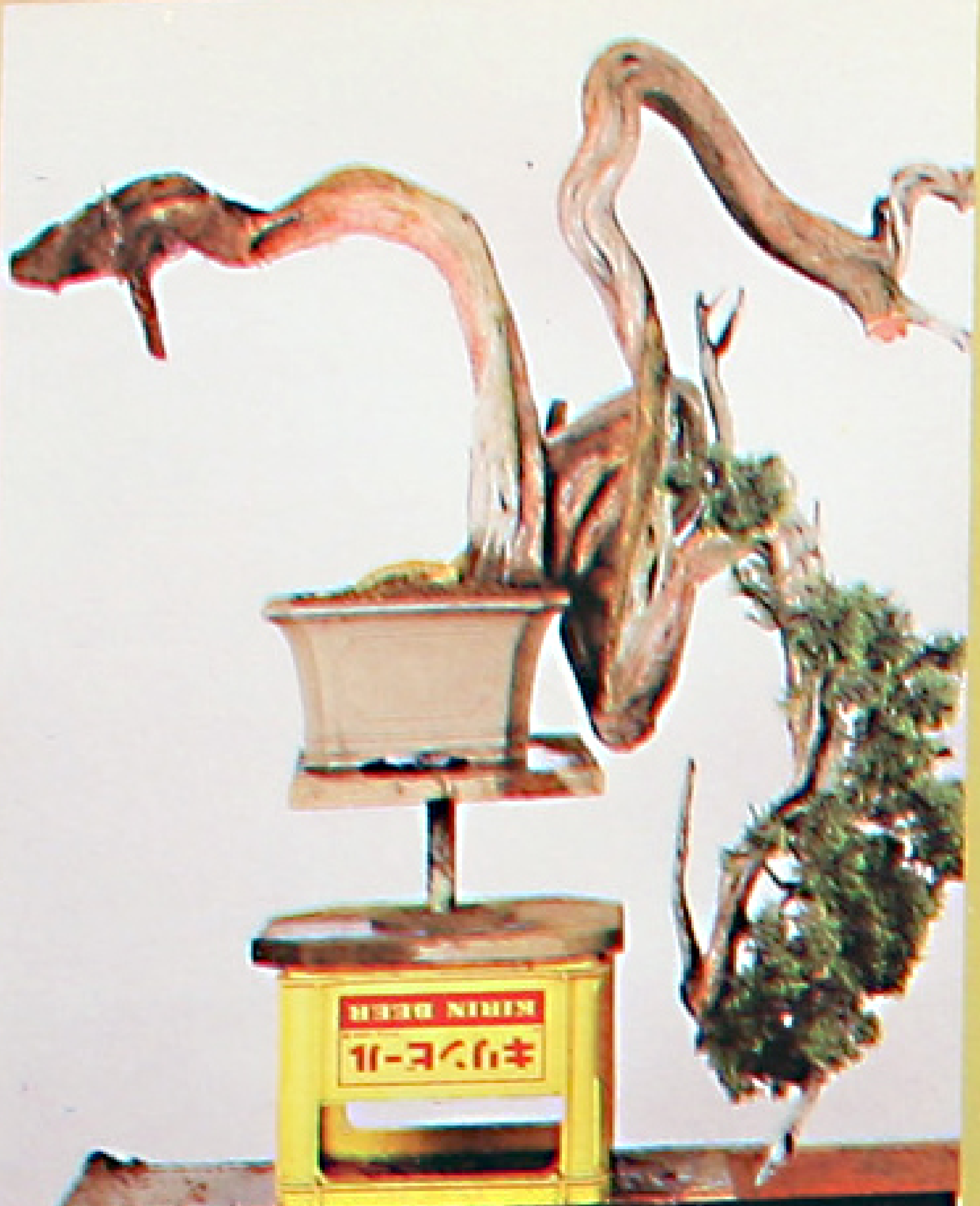
Once the bark strip was bent and adjusted, the tree was securely fastened to the container with the help of pieces of bamboo and wire, secured in the drainage holes, as you can see in the photographs.

When the container was filled with potting soil, the planting was finished.

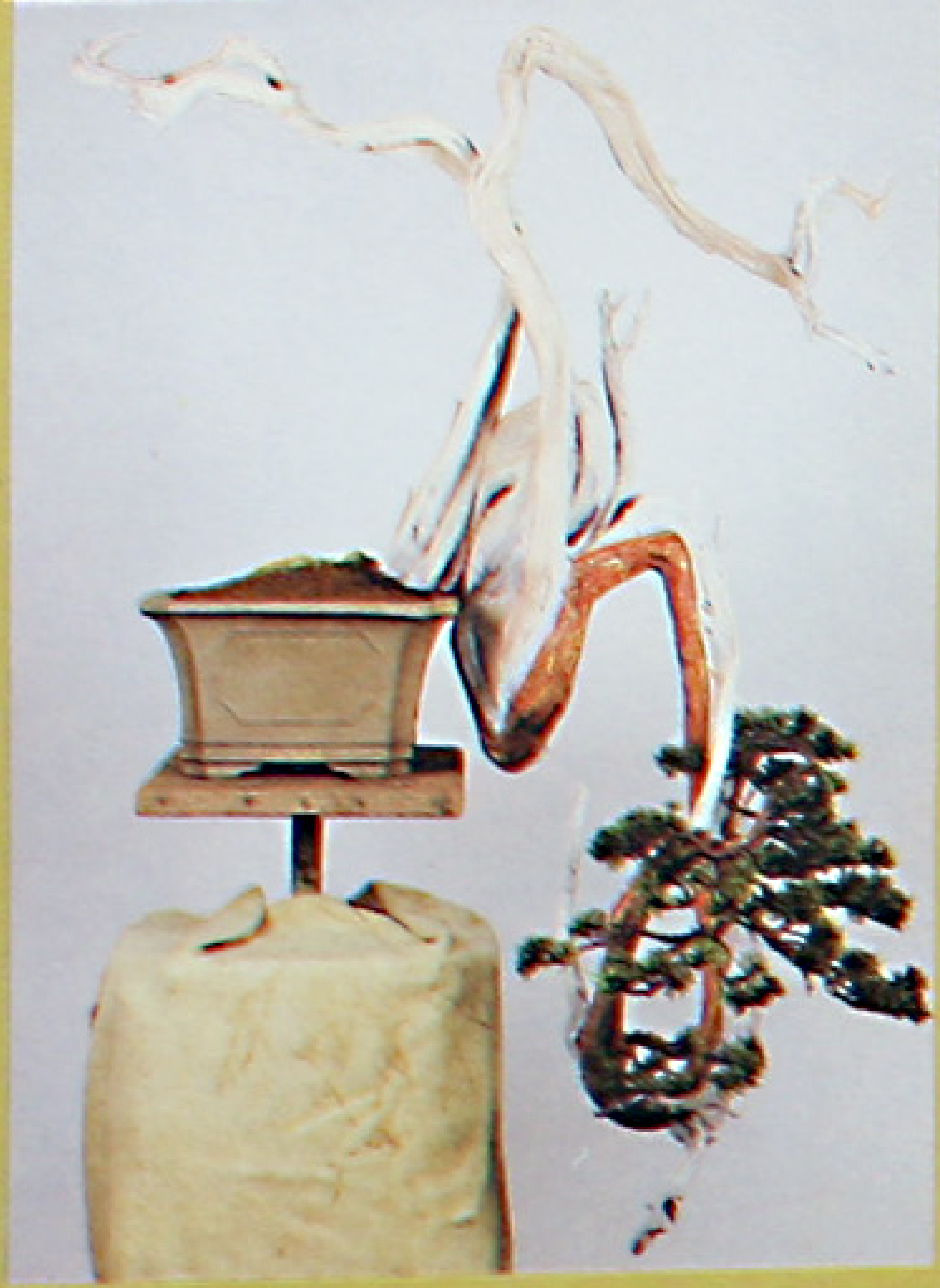
As you have seen, thanks to Mr. Kimura's genius and technique, the resulting design is consistent with what was desired. Technique serving art!

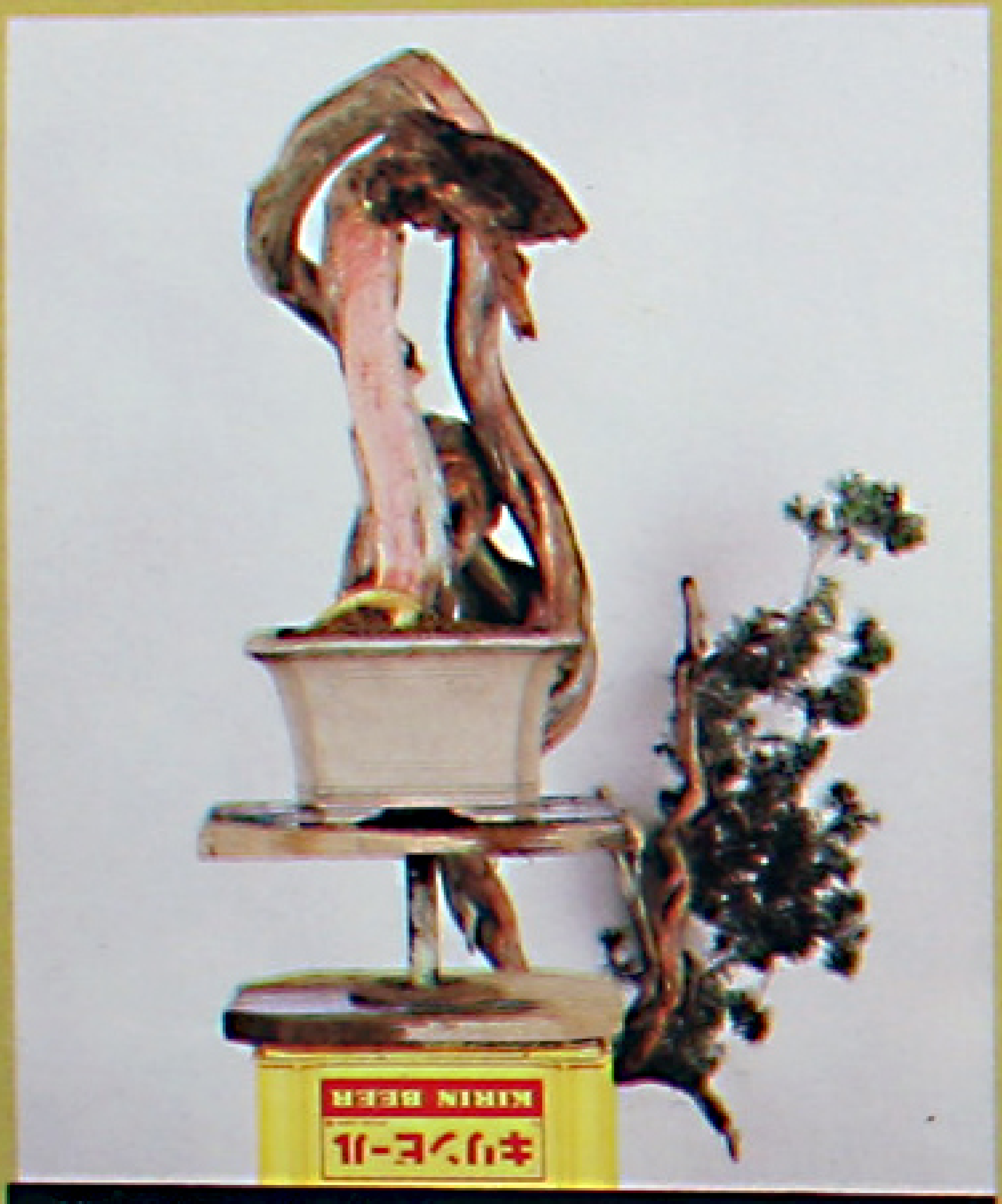


Technique serving art.

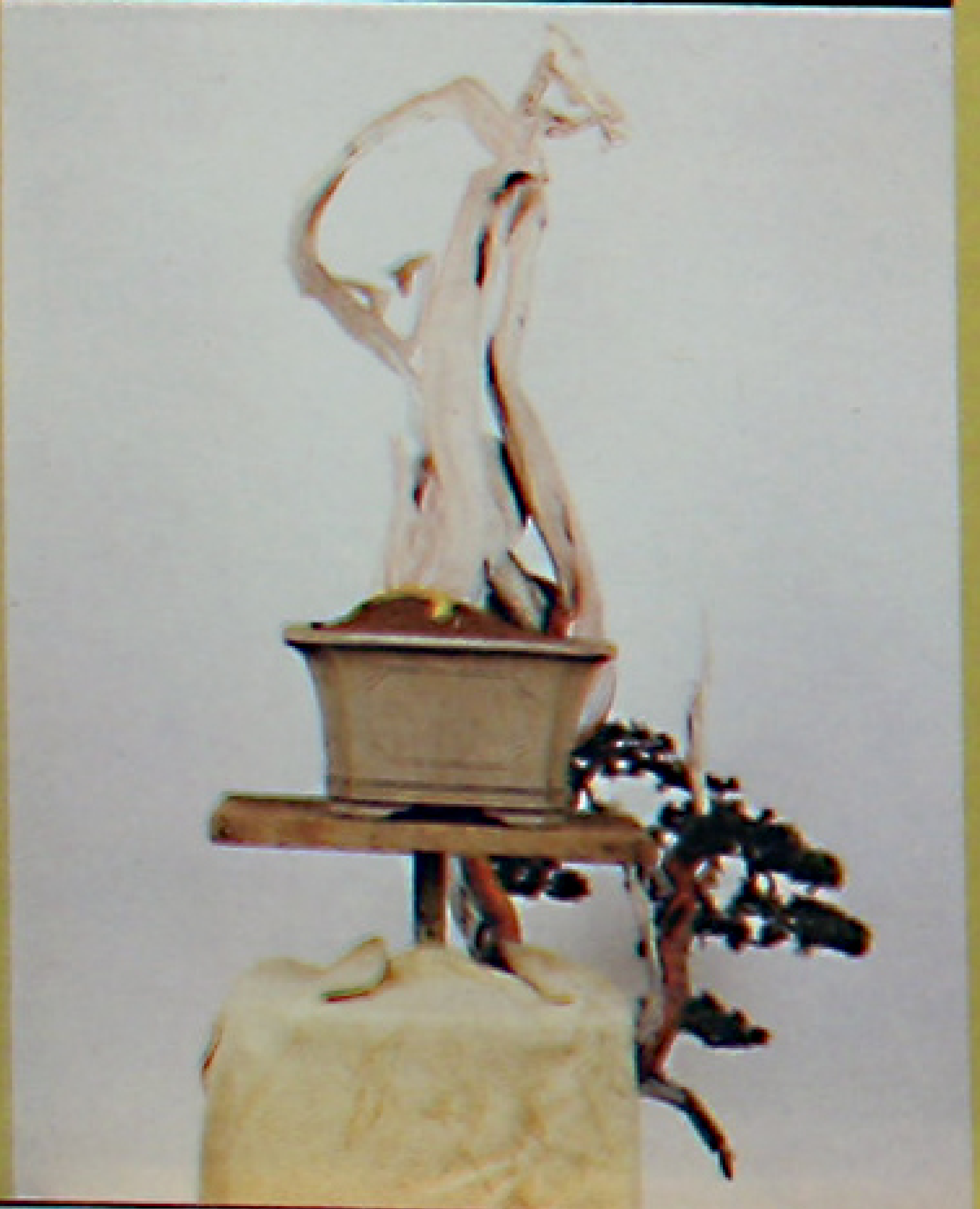


View from the left.





View from the back.



After giving the tree a period of rest and recuperation, during which it was kept in a greenhouse, and after observing that the budding was continuing normally, we proceeded to the final tasks of weathering the wood and wiring on July 7, 1984.

Since the base of the tree consisted simply of a very narrow vein of live wood, it was perfectly possible, technically, to maintain throughout the tree, even to the branches, the same proportion of live wood.

So, the first step was to define the vein, and then peel the bark from the rest of the trunk.

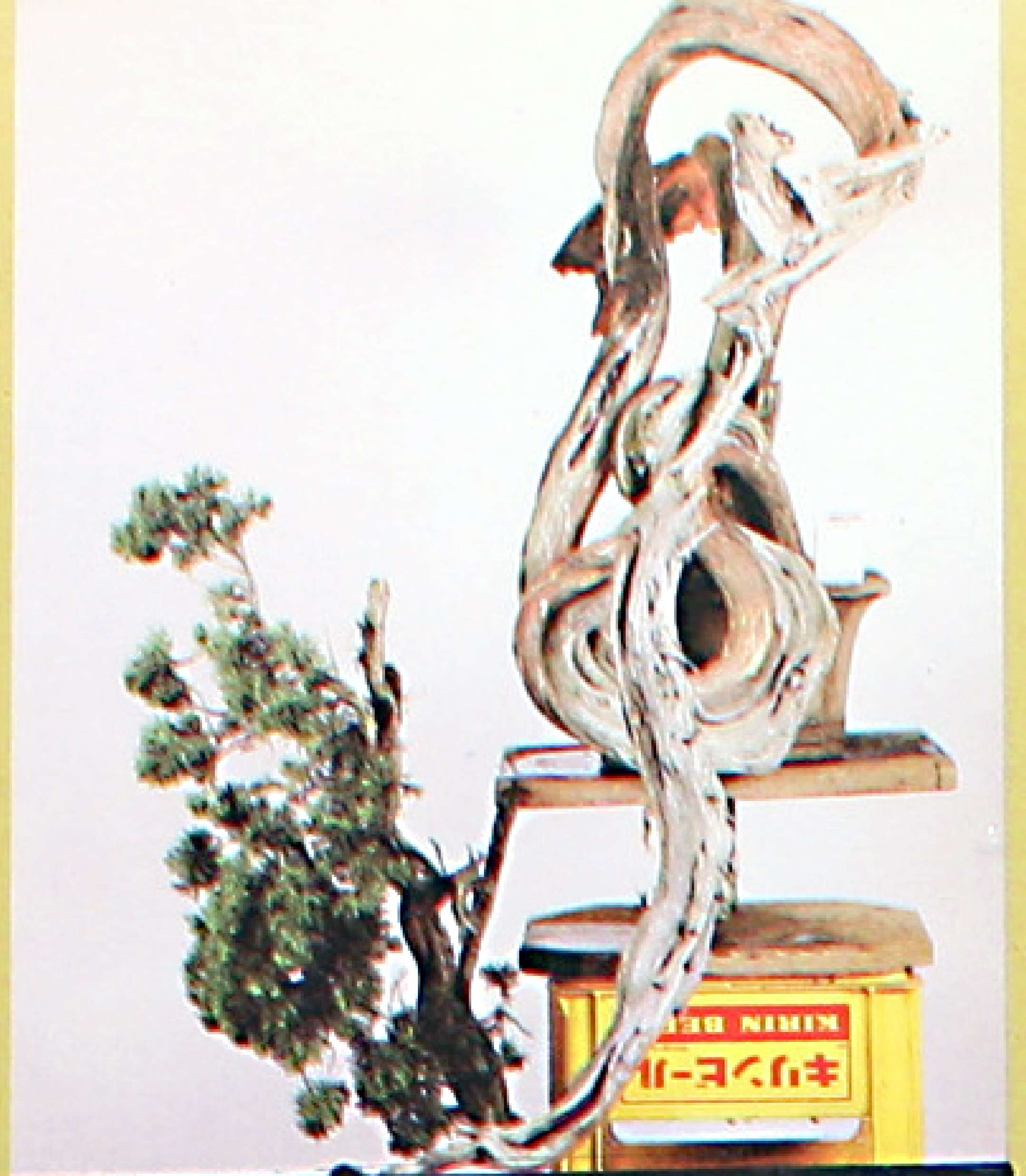
Later, with the help of a power tool and various tool bits, the wood was sculpted without complication.

The arrangement, wiring, and design of the foliage followed traditional principles for cascading trees. However, a triangular silhouette was purposefully not obtained, but rather a rounded one, to harmonize with the most interesting part of the tree: the part with the central curves.

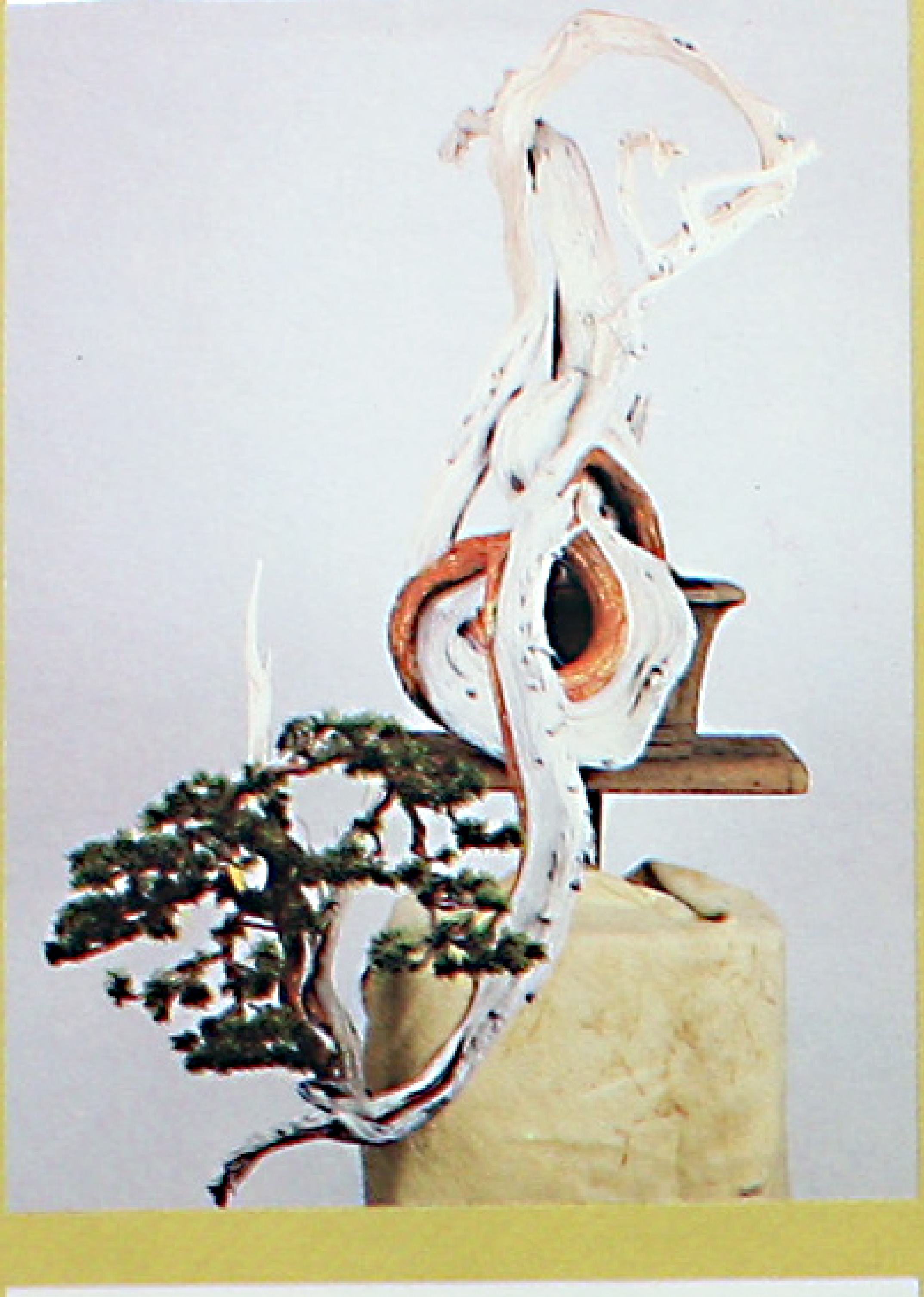
The result, in October 1984, was what was desired. Imagine, behind the tree is the mountain, and below, the precipice...

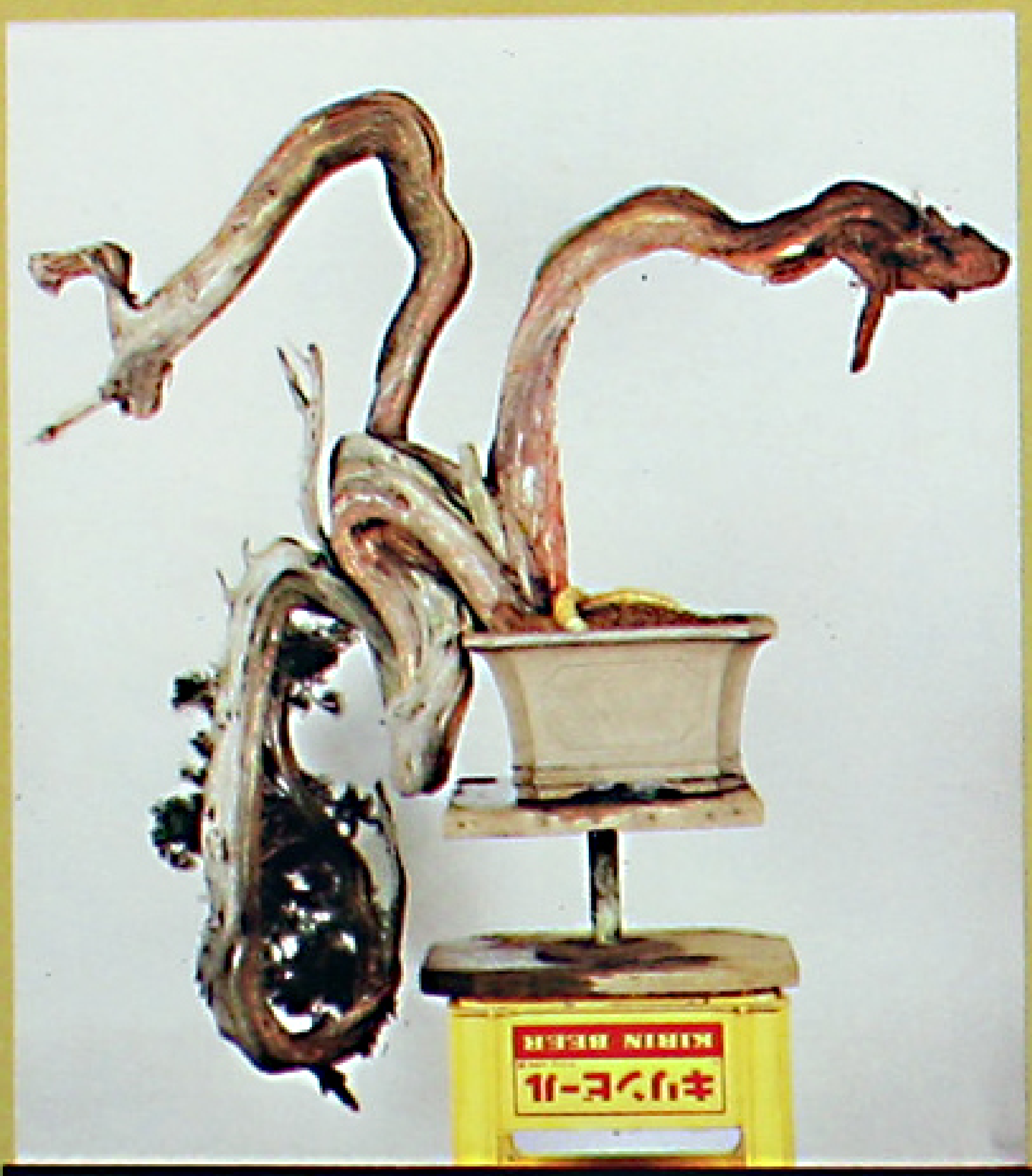
Next page: The tree is it appeared in October 1984, just 4 months later.

Height: 4 ft., 8 in. Diameter of the trunk at its base: 4inches.

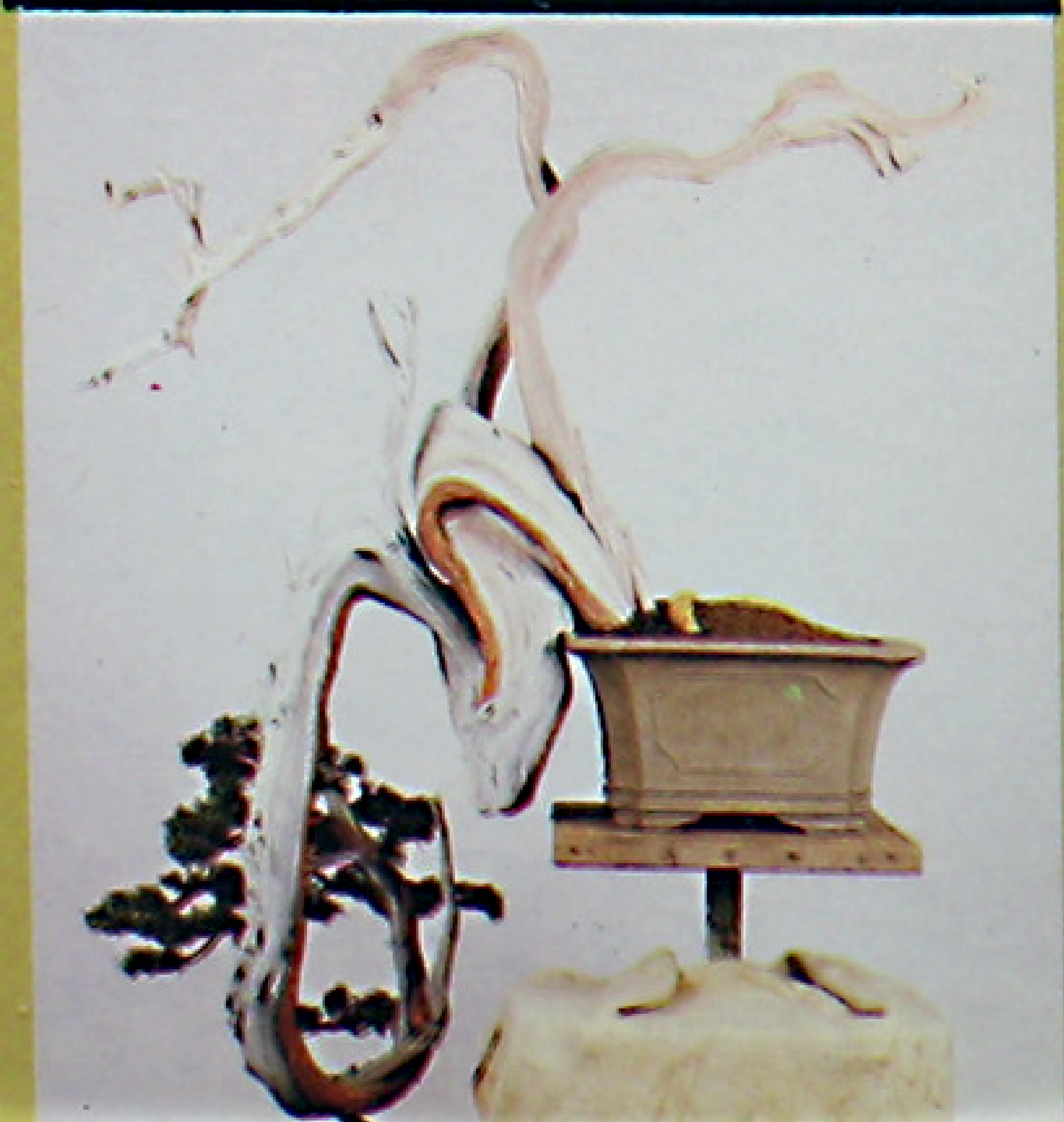


View from the front.





View from the right. Note the position of the tree in its container.



BONSAI BASICS

A Review of Basic Concepts and Techniques

In this article, some of the basic principles and concepts that apply to the cultivation of Bonsai will be reviewed. It is not the intention of this article to cover these subjects in great detail, but rather to present an overview. Many of these subjects have been fully treated in this or previous issues of BONSAI TODAY, or will be presented in future issues.

PINCHING.

Bonsai need repeated trimming, so that they grow in a balanced fashion in all directions and maintain the desired silhouette. Pinching is the slight pruning or trimming of new growth that keeps the tree in proportion and counteracts the tendency of the tree to grow strongly upwards.

As bonsai begin to bud in the spring, just as in other trees, there is a strong tendency to shoot up vertically. If this is not discouraged in some way, it will not be long before a healthy tree will be tall and spindly, lower and interior branches will have died back and all the foliage will be gracing only the ends of the branches. What was perhaps an artistic statement no longer has much to say.

Pinching is an ongoing activity throughout the active growth season. When the end of a small new shoot is pinched, two small shoots usually form. If these in turn are pinched a few weeks later, each will form two more shoots. So if one could pinch three times in the growing season what would have been a single straight branch now is much shorter with perhaps eight little branchlets. Pinching then is the primary technique for developing the quality of the branch structure or ramification. The distance between leaf nodes will also gradually shorten and, in time, leaf or needle size will diminish.

Typically each new shoot on deciduous trees is allowed to lengthen to five or six leaf nodes and then pinched or cut back using scissors to one or two leaf nodes. If a specific branch needs to lengthen, then it is pinched to leave more nodes.

For needled evergreens, except pines, pinch new buds with the thumb and index finger removing half or more of the cluster of emerging needles. It is important to do this by hand; if pinching were done with scissors, the cut tips of the needles would turn brown and quite possibly many of the small buds that have not yet become active would be damaged.

Pinching new growth of pines is a specialized subject beyond the scope of this review. The article *Black pines: Developing Short Needles,* appearing in this issue, explores pinching techniques for two-needle pines. However these methods are not appropriate for five-needle pines.

PRUNING

At the end of a year of growth, we have, through pinching, been concerned only with the silhouette of the tree and branches; but when fall and winter arrive, and leaves fall, we can better see the branch structure and may find branches that are tangled and confused. Pruning is the process of cutting and removing branches from the growth of the previous year or previous years to clean up the design.

As a general rule, avoid all branches that grow straight up, straight down, towards to tree's interior, or that cross each other; cut them off. Also cut off any dead branches (unless they can be used for a *jin* — See the article *Creation of dead wood* in this issue) or branches that are just plain unsightly, or in the wrong place.

Most growers of bonsai consider the use of a sealant on fresh wounds to be beneficial, although there are some contrary views. Until conclusive studies prove otherwise, it is recommended that a sealant be applied to the branch or trunk where it has been cut. Most bonsai growers use Cut Paste, a Japanese compound developed around the turn of the century, or more readily available white glue.

Trees that naturally produce substantial resin when a branch is severed, like young pines do not require a sealant.

LEAF PRUNING

Used on deciduous trees only, leaf pruning consists of removing all of the leaves at the right time of year in order to achieve various effects:

— To reduce the size of the leaves and achieve better scale; the second crop of leaves will be a little bit smaller.

— To improve branch ramification by inducing a second set of buds to develop in the same season.

— To avoid burning of the leaves of delicate species, like the maple, for instance, due to the heat of summer months.

— To produce more intense fall colors.

— To stimulate the growth of interior buds, which otherwise would not receive enough sun to bud.

— To provide the grower all the joys that a "second" spring may bring.

—As a precaution, to reduce the demands on the roots for water should a tree have to be transplanted out of season.

Leaf pruning should only be done on healthy, young Bonsai that have been strongly fertilized beforehand.

The appropriate time to defoliate is just after the first crop of leaves has fully matured. This may be as early as mid-May in the South, or as late as mid-July in more northern areas. In warm climates, with vigorous trees, the second crop of leaves may also be removed, effectively squeezing the effects of three years into one.

If a tree is defoliated too early in the season, the second growth of leaves may not reduce in size and may only develop at the tips of the branches. One technique used to avoid this tendency is to cut the smallest and interior leaves first, and, then a week later, the larger ones and those at the tips of the branches and at the apex.

If defoliated too late, the tree may not have been in leaf long enough to store a sufficient amount of food to sustain the tree through the approaching winter.

Cut off all of the leaves, leaving half of the leaf stem (petiole) in place. It is important to remove **all** of the leaves, that's every last leaf, to ensure that there are no remaining leaves which might discourage new leaf growth by forming an auxin inhibiting the formation of new leaves.

Leaf pruning is commonly practiced on Japanese maples (but not thread-leaf varieties), elm, zelkova, and, in fact, on most deciduous trees.

FERTILIZING

Bonsai live in a relatively small container where the availability of nourishment is obviously limited. When the tree begins to grow, it absorbs the nutritive elements it needs from the soil in the container as well as from water and the surrounding air, and, in addition, from the air that enters the soil replacing the water as the soil dries out.

There are 16 elements essential to sustain proper plant growth. Carbon, hydrogen and oxygen are absorbed from water and the air. The remaining 13 must be absorbed by the roots from the soil. If these element are not present and available in the soil, the plant will not be healthy and vigorous.

As the plant absorbs the elements that are in the soil, they must be supplemented and replaced. The sensible way to do this is by regularly applying fertilizer. In fact, many bonsai growers presently use a soilless mix, in which case particular care must be taken to ensure that all the necessary elements are provided. Fertilizing practice must be consistent with the soil mix. This in part explains some of the widely differing recommendations you may encounter.

In any case, federal law requires that the three principal macronutrients responsible for plant growth be identified on chemical fertilizer labels. The percentage content of nitrogen, phosphorus and potassium (often called potash) must be identified in that specific order. Thus, for example, a fertilizer identified as 20-10-5 would contain 20 percent soluble nitrogen by weight, 10 percent soluble phosphorus by weight and 5 percent soluble potassium by weight. If you have trouble recalling which number is which, remember that they are in alphabetical order.

The total of the three principal elements in the preceding example is only 35 percent. What happened to the remaining 65 percent? The remainder consists of filler and smaller amounts of the remaining 10 elements: boron, calcium, chlorine, copper, iron, magnesium, manganese, molybdenum, sulfur and zinc in various chemical forms. These are called fertilizer trace elements. If you look at the small print on the fertilizer box, you will often see these identified.

As a practical matter, however, most bonsai growers do not bother reading all the small print, even if their eyesight permits. The best approach is to alternate from one brand to another at each fertilizer application. That should provide an adequate supply of all the trace elements. From a bonsai perspective there is not much difference between the major brands; the basic identified percentages of nitrogen, phosphorus and potash should be your guide.

It is important to understand the role of these elements in the growth cycle of plants, so that you may apply a fertilizer appropriate to the plants needs at that particular time of the season.

Nitrogen strongly promotes the growth of branches and leaves, so it doesn't make sense to use a high nitrogen fertilizer in the fall as winter dormancy approaches. A deficiency of nitrogen in the active growing season results in decreased growth with leaves turning a light green or yellow. However, nitrogen must be applied carefully in some species to avoid too lush a growth and long internodes, a characteristic not desirable in bonsai. In the extreme, too much nitrogen can cause "fertilizer burn" which may be fatal.

Phosphorus is used by trees to produce flowers, fruit and seeds, aids in the process of photosynthesis, and stimulates root growth. Plants just don't grow well without sufficient availability of phosphorus. One of the recognizable signs of phosphorus deficiency is the development of purple or red areas on leaves caused by the impairment of photosynthesis and resulting loss of chlorophyll.

Potassium ensures general plant vigor, increases resistance to disease, activates enzymes which help the plant use other elements and in a sense counters the tendency of nitrogen to produce too much growth. Potassium also helps the plant endure winter temperatures. The first sign of potassium deficiency is yellowing at the edges of the leaves.

Calcium, magnesium and sulfur also play major roles, but are normally present in adequate measure in most soil mixes; seldom do these elements need to be supplemented.

The remaining elements are micro-nutrients, required in only very small amounts. By alternating fertilizers, an adequate supply is usually obtained.

When using chemical fertilizers, evaluate the basic porosity of your soil mix and your watering practice, before deciding on the concentration of the fertilizer that you will use. There are about as many ideas on which ones to use, how much, and how frequently to use them as there are people who grow bonsai. Some fertilize heavily; others lightly. You will just have to find what best suits your plants in your particular area. If you fertilize with full strength fertilizer, once a week, as some people do, then it is essential to have a fast draining soil and it follows that you must water more often, perhaps twice a day.

Lacking better guidance, your best bet is to use half strength fertilizer every other week during the active growing season.

The use of "natural" or organic fertilizers has become very popular in recent years and chemical fertilizers seem to have gotten a bad name. There are certainly zealous supporters of both and we will not go into the relative merits of each here (perhaps the subject of a future article). Maybe it is more a question of lifestyle than it is of horticulture. In any case, as far as your bonsai are concerned, they only recognize chemicals and they are not too fussy about how they get them — as long as they do get them.

Organic fertilizers include blood meal, bone meal, fish emulsion and ground up seeds like rapeseed, cottonseed, etc.

In spite of a broad diversity of opinion, there are still some general practices that most growers of bonsai accept. Following is a list of some fertilizer dos and donts:

— Do fertilize on a regular schedule.

— Do consider the porosity of your soil mix and your watering practices.

— Do alternate fertilizers

— Don't fertilize flowering trees when they are in flower.

— Don't fertilize a newly repotted plant until new growth has started, at least three or four weeks later.

— Don't fertilize a sick plant.

— Do fertilize young trees more than older ones.

— Do ease up on nitrogen in the fall.

— Do use fertilizers higher in phosphorus and potash in the fall.

— Don't fertilize dormant plants in the winter.

— Do resume fertilizing when spring growth starts.

Bonsai are pretty resourceful; they survive and flourish under a wide variety of fertilizing practices. Settle on a routine which suits you and your plants best. If one plant rebels, you will know it. Remember, as John Naka says, "trees want to live, too."

TOOLS OF THE TRADE

Bonsai do require some attention if a desired design is to be achieved and maintained. It makes sense to acquire specialized tools to make one's job easier, particularly as the breadth of one's collection expands.

The essential tools are:

— Long-handled scissors to reach the interior regions of the tree.

— Strong scissors to prune small branches and roots.

— Concave cutters, specially designed for Bonsai, which permit removing branches cleanly allowing the formation of an inobtrusive callus after pruning.

— Wire cutters with rounded tips, allowing one to cut the wire off a branch without damaging the bark.

— A rake that permits cleaning the soil off roots with minimal damage (a chopstick may suffice).

As one's depth of interest increases, so does the size of one's tool box. There are a myriad of specialized tools available, all designed for specific bonsai-related tasks.

WIRING

Wiring is a technique used to modify the shape of a tree. A relatively strong wire is coiled around a branch or the trunk; then when the wire is bent to a new position, the branch will follow right along without springing back. If we leave the wire there long enough, the branch will take a permanent set and remain at that position when the wire is removed.

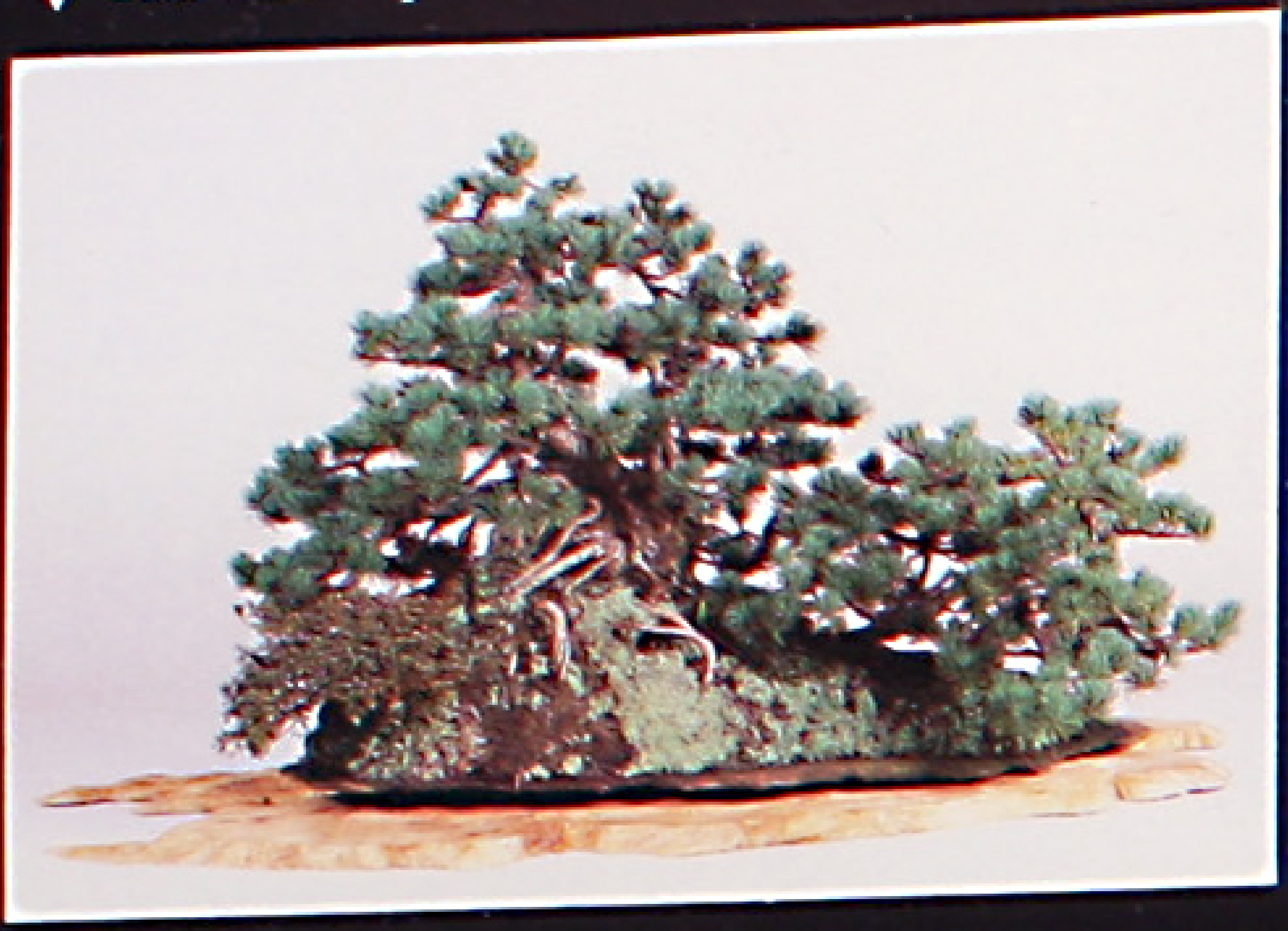
As the wired Bonsai grows, its branches and trunk thicken and, if one is not attentive, the coiled wire may cut into the bark. It is not aesthetically pleasing to have "wire cuts"; so before this occurs, wires must be removed.

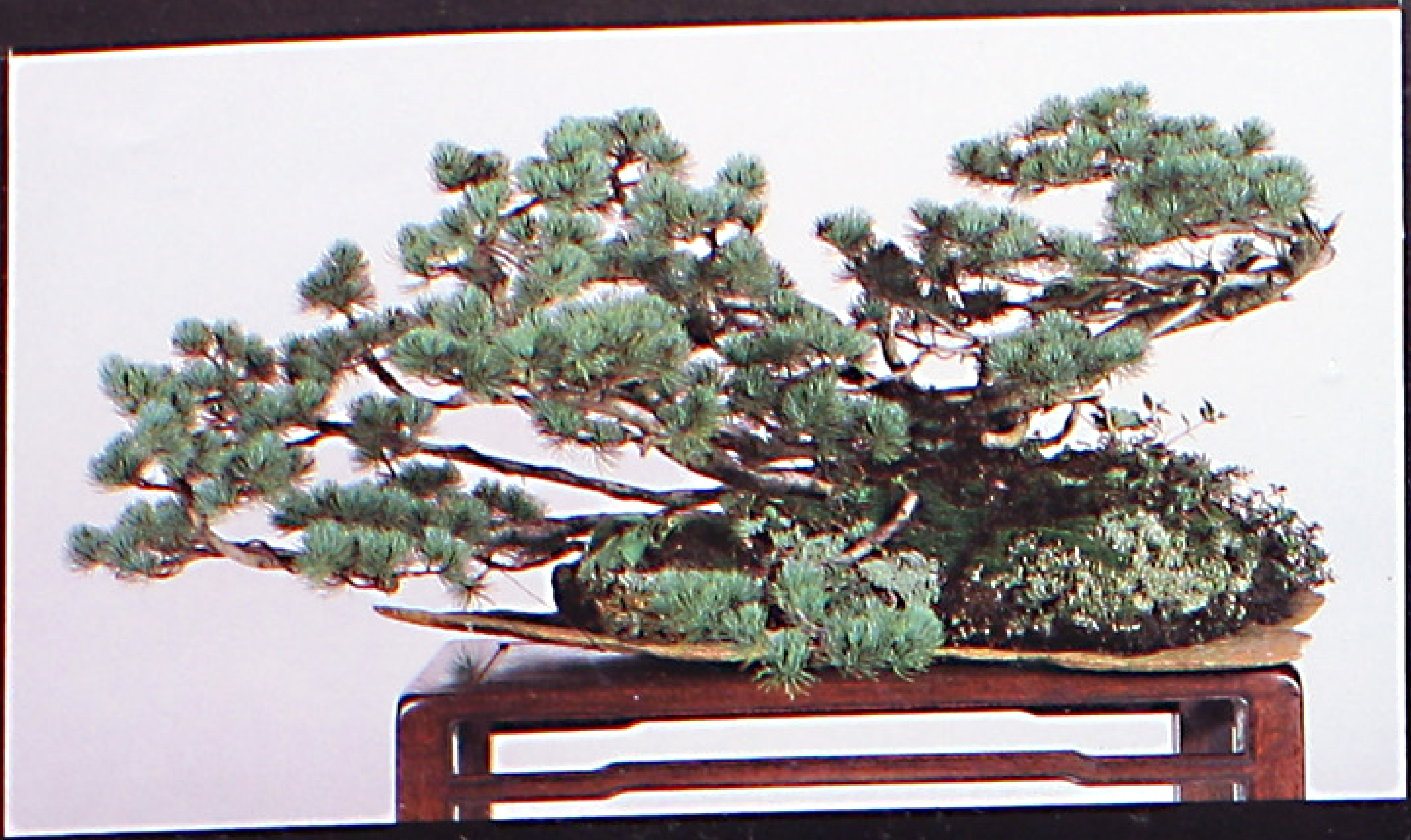
If, in a few days, the branch returns either fully or partially to its original position, then it must be rewired and repositioned.

A lengthy article on wiring techniques is included in BONSAI TODAY, issue No. 1.

Previous page:
Five-needle pine. Pinus parviflora pentaphylla. Height: 97 cm.

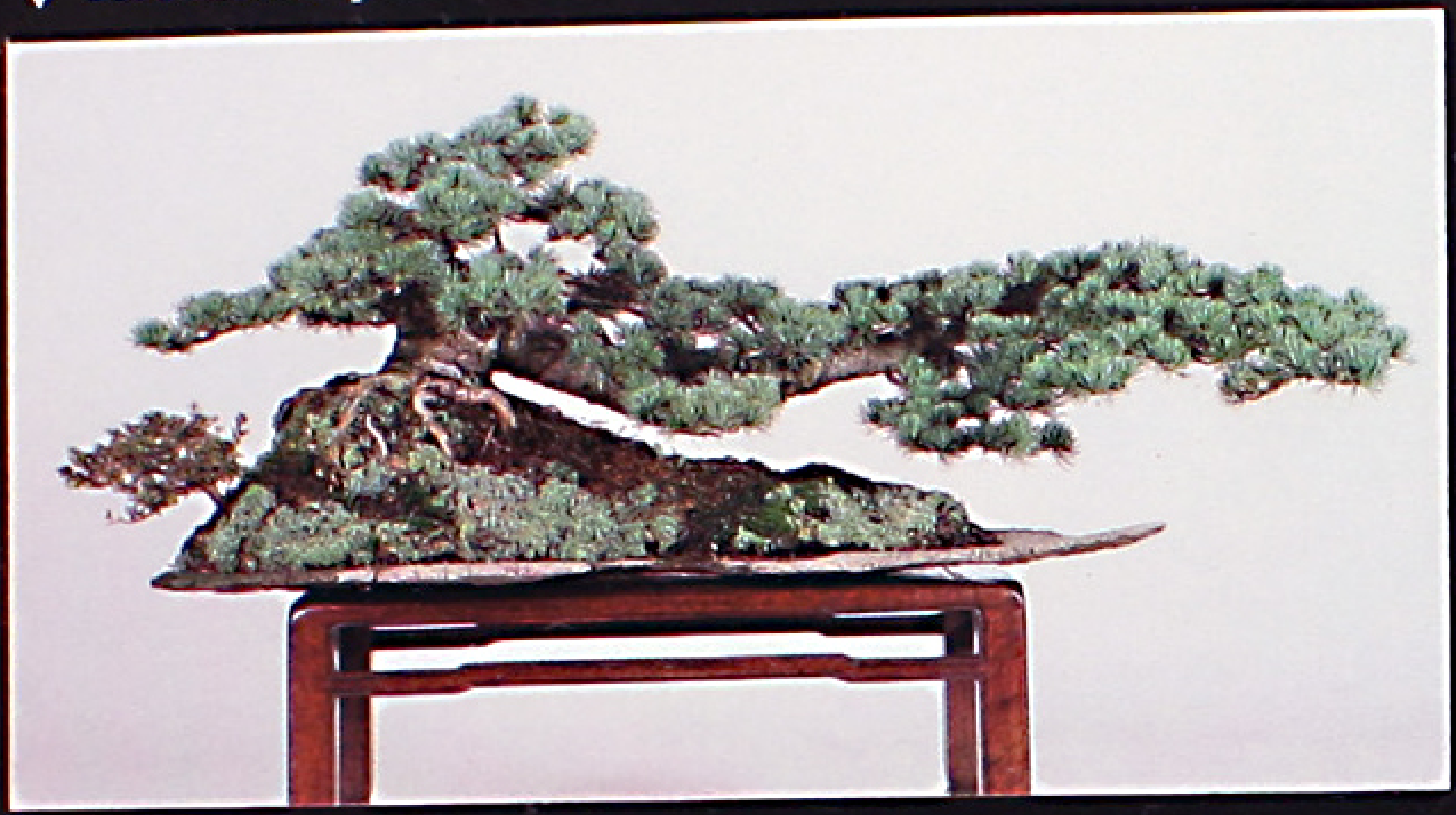
▼ Five-needle pine. Width: 105 cm.



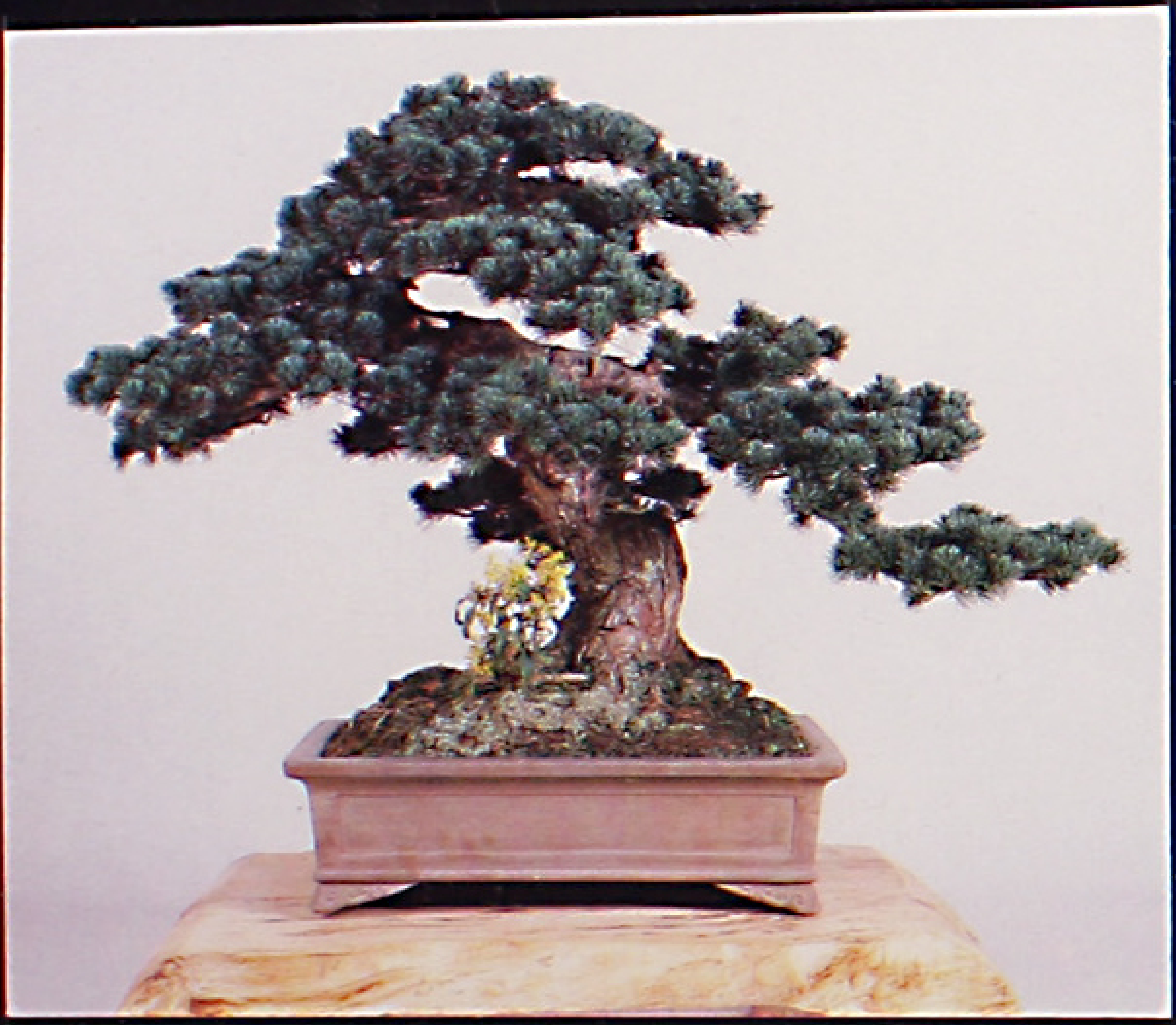


▲ Five-needle pine. Width: 112 cm.

▼ Five-needle pine. Width: 128 cm.



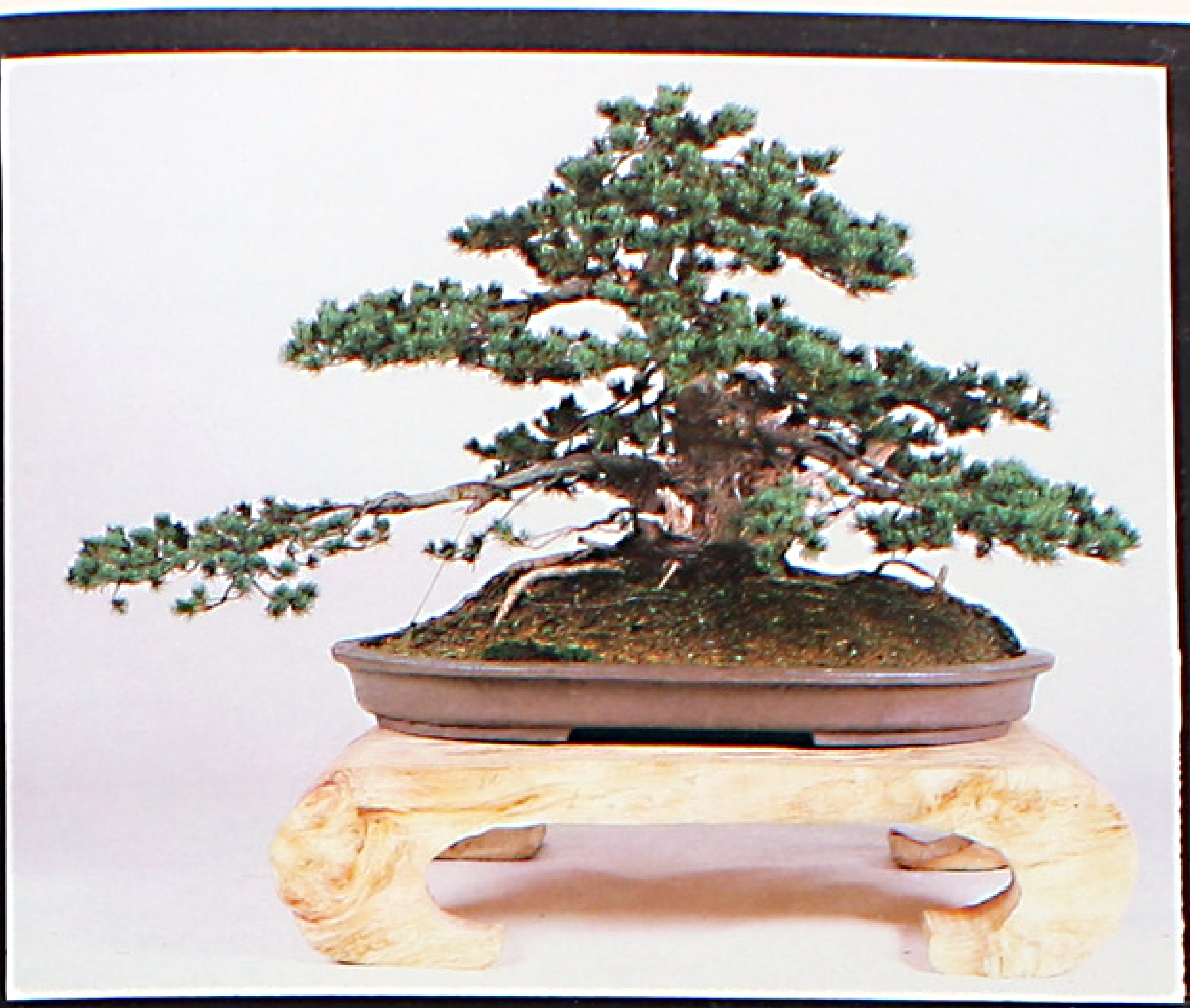
▼ Five-needle pine. Height: 66 cm.



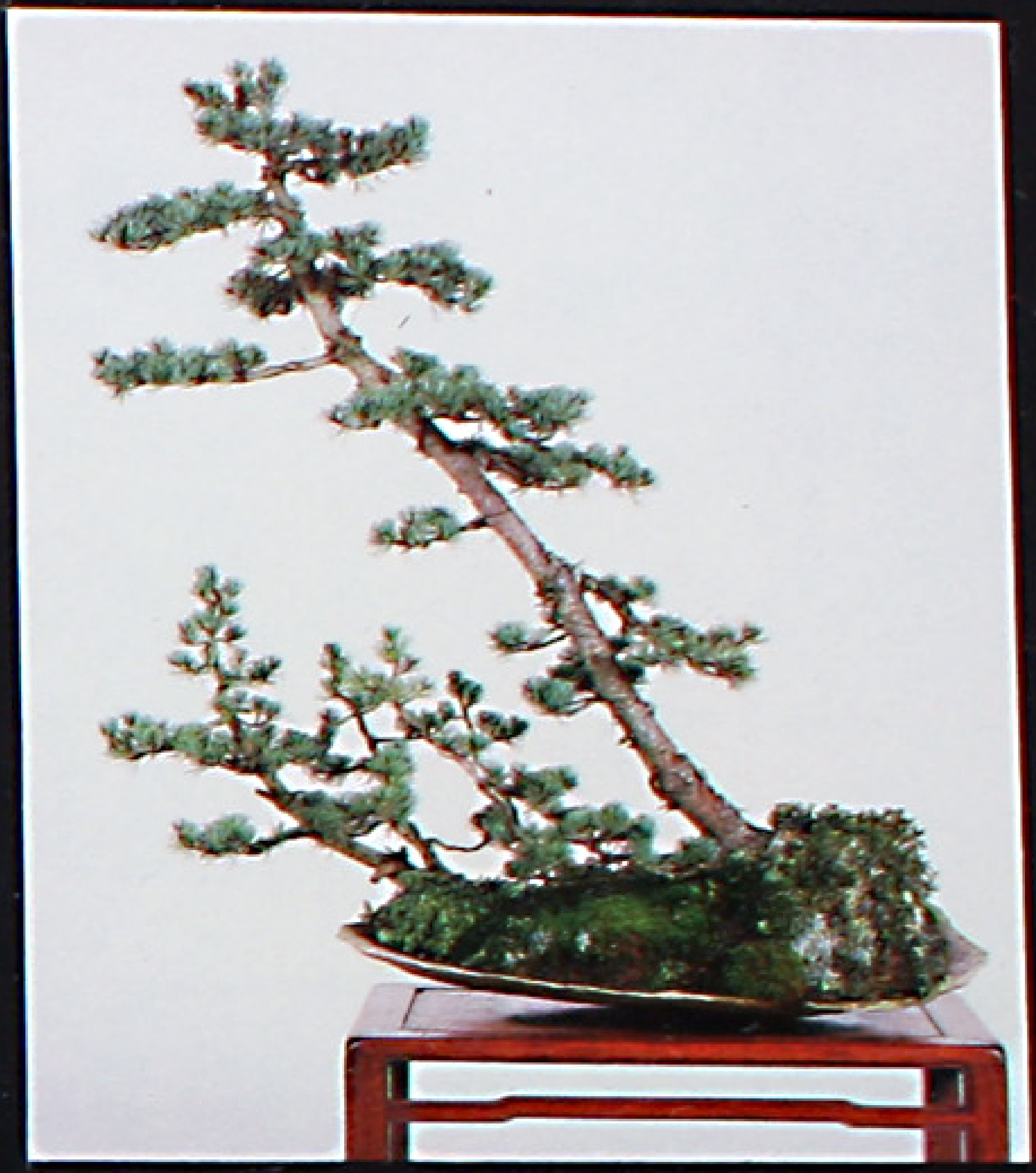
GALLERY

These photographs of some of the finest bonsai are meant for study and appreciation, and to provide inspiration for the creation of bonsai.

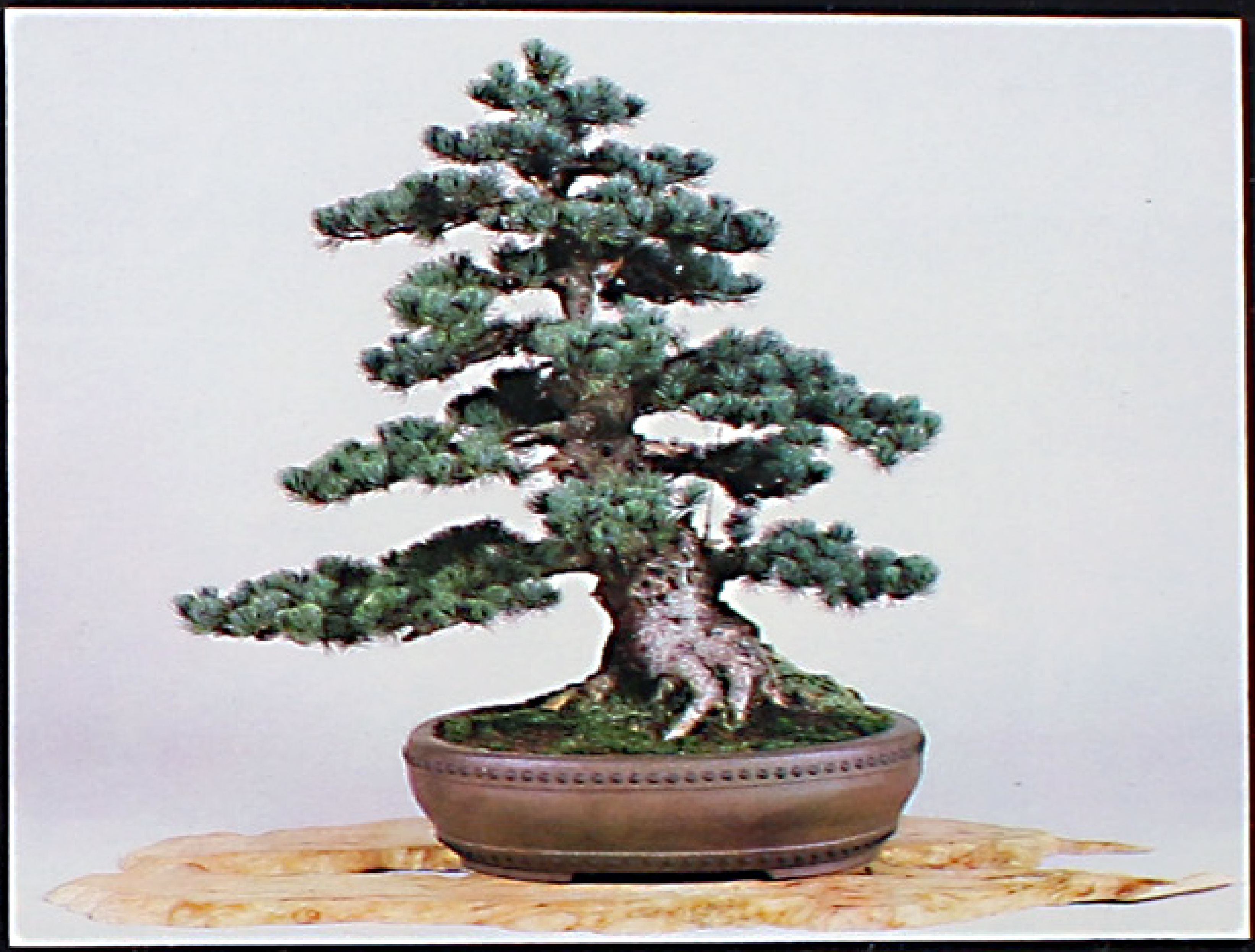
On this and the next two pages we present a selection of five needle pines from the collection of Mr. Kurakichi Abe. The trees styled by Mr. Abe deserve some special attention. In Japan, he is recognized for his innovative approach.



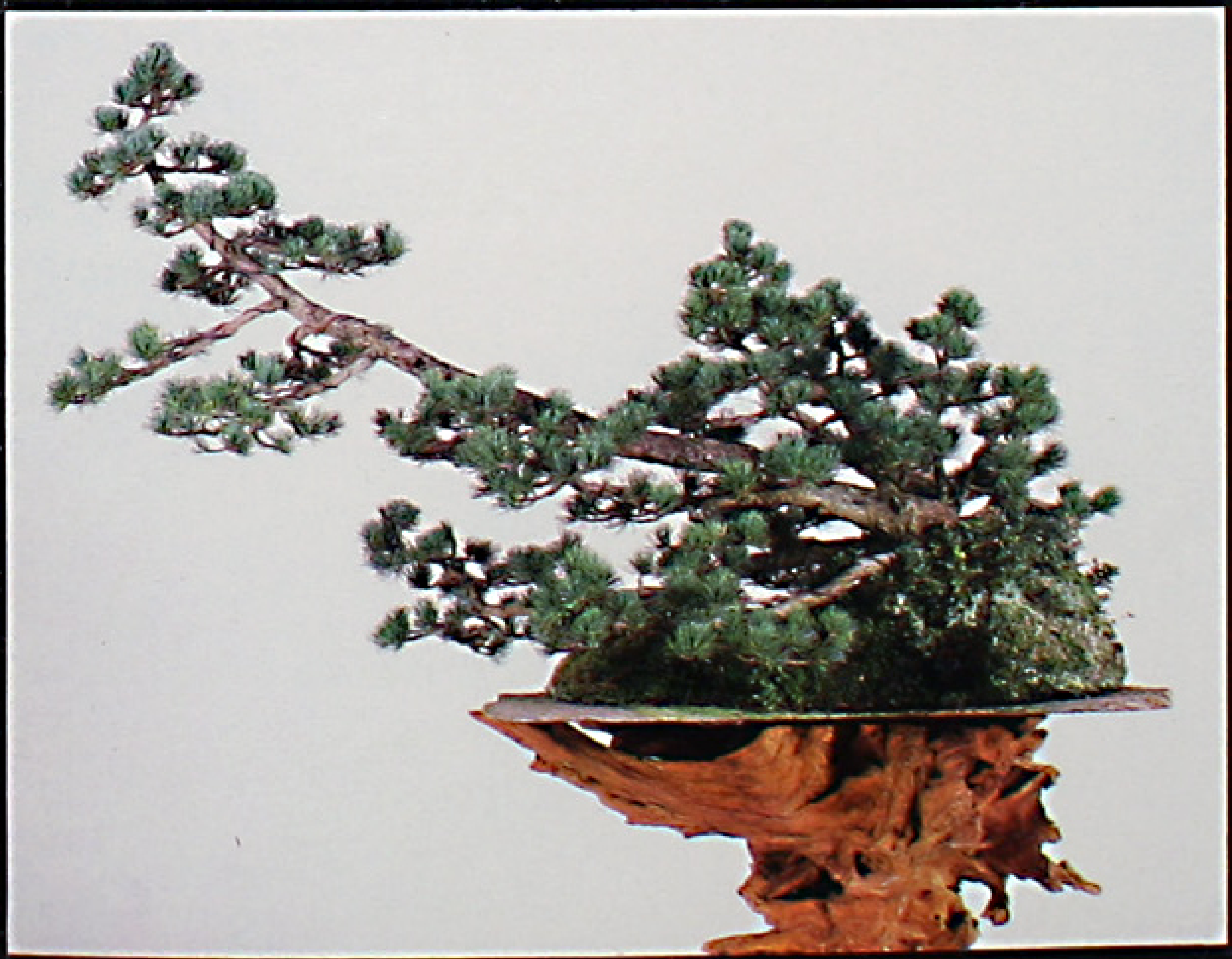
◀ Five-needle pine. Height: 58 cm.



▲ Five-needle pine. Height: 98 cm.

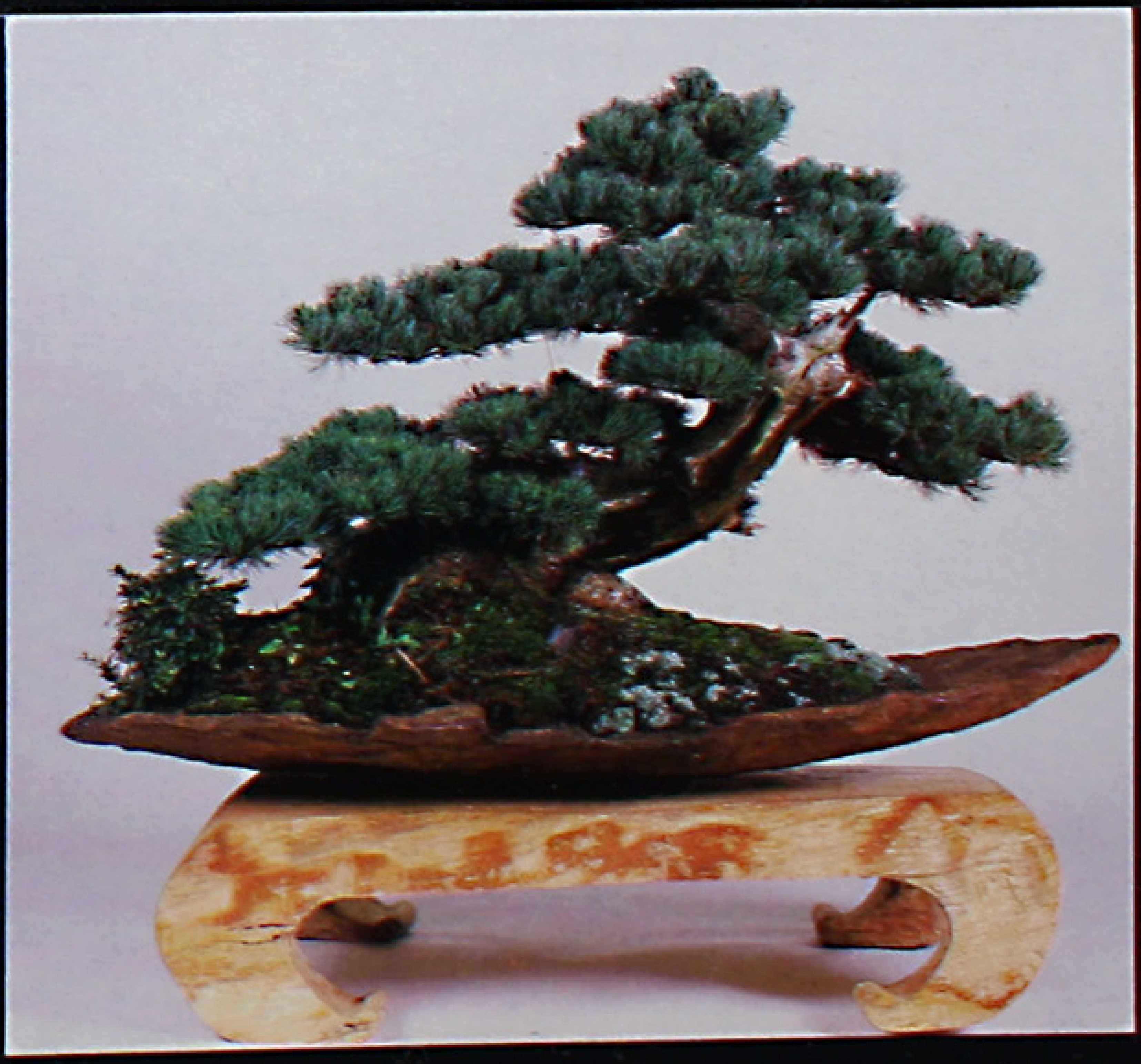


◀ Five-needle pine. Height: 79 cm.



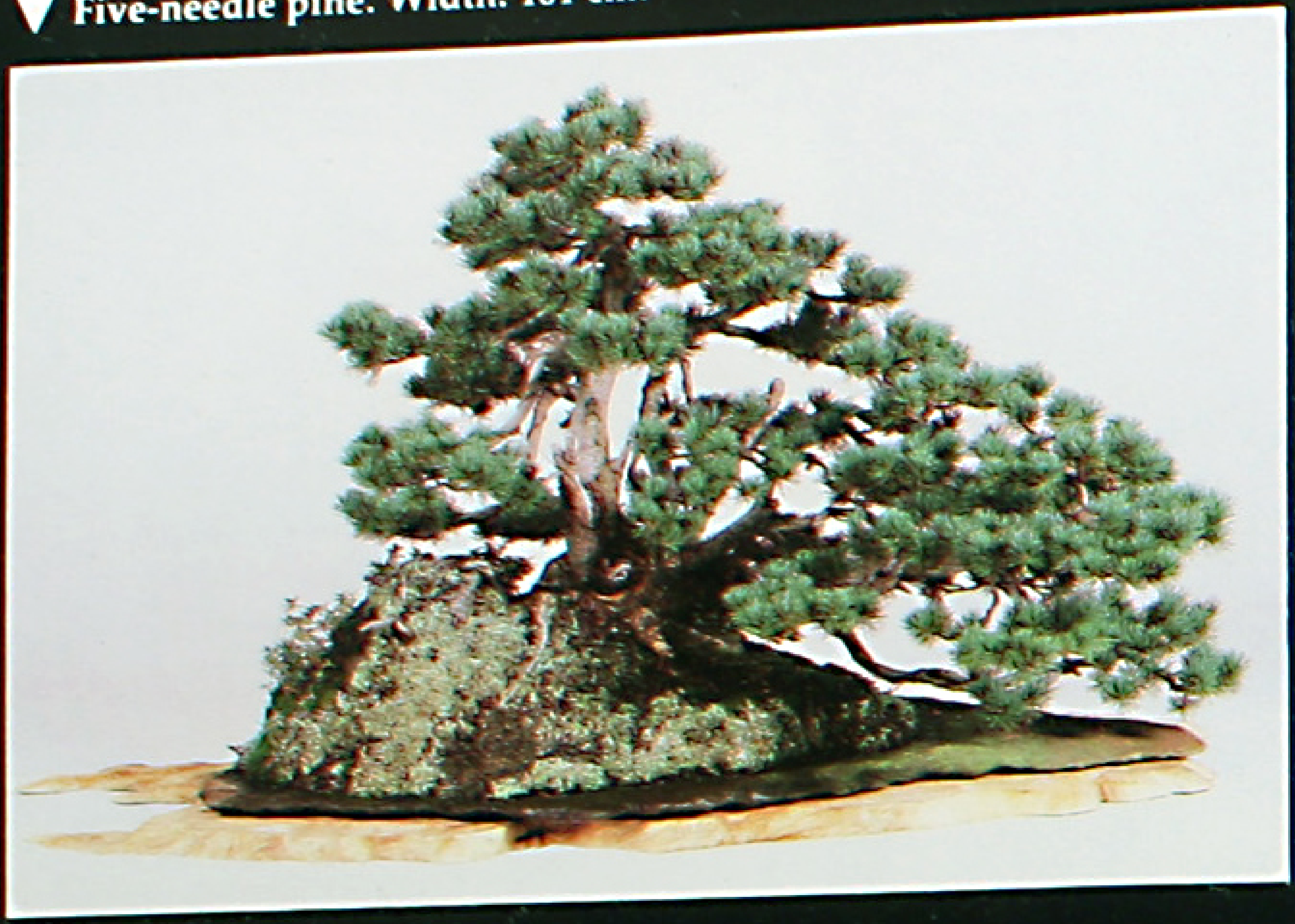
▲ Five-needle pine. Width: 107 cm.

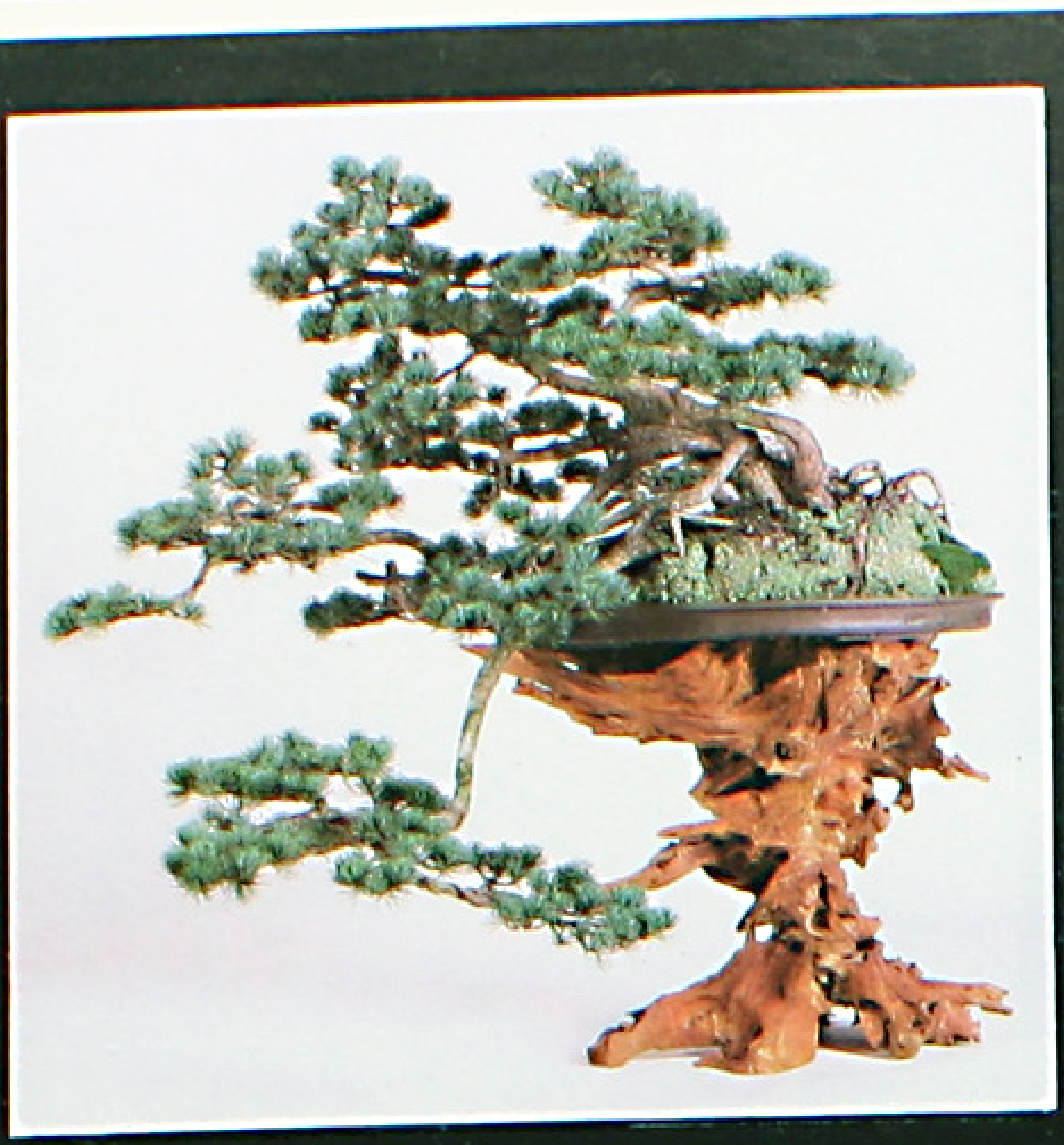
▼ Five-needle pine. Height: 52 cm.



GALLERY

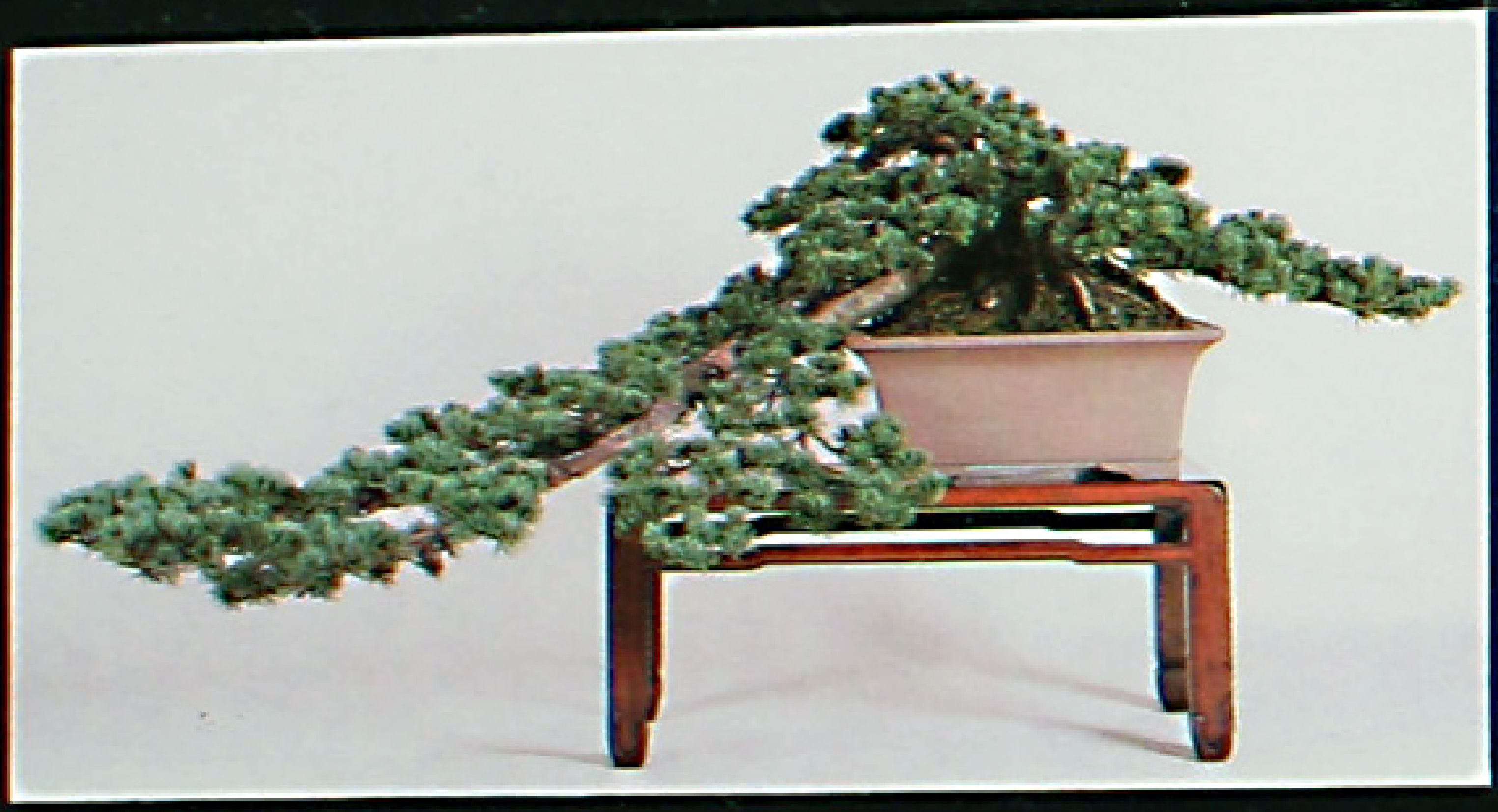
▼ **Five-needle pine. Width: 101 cm.**



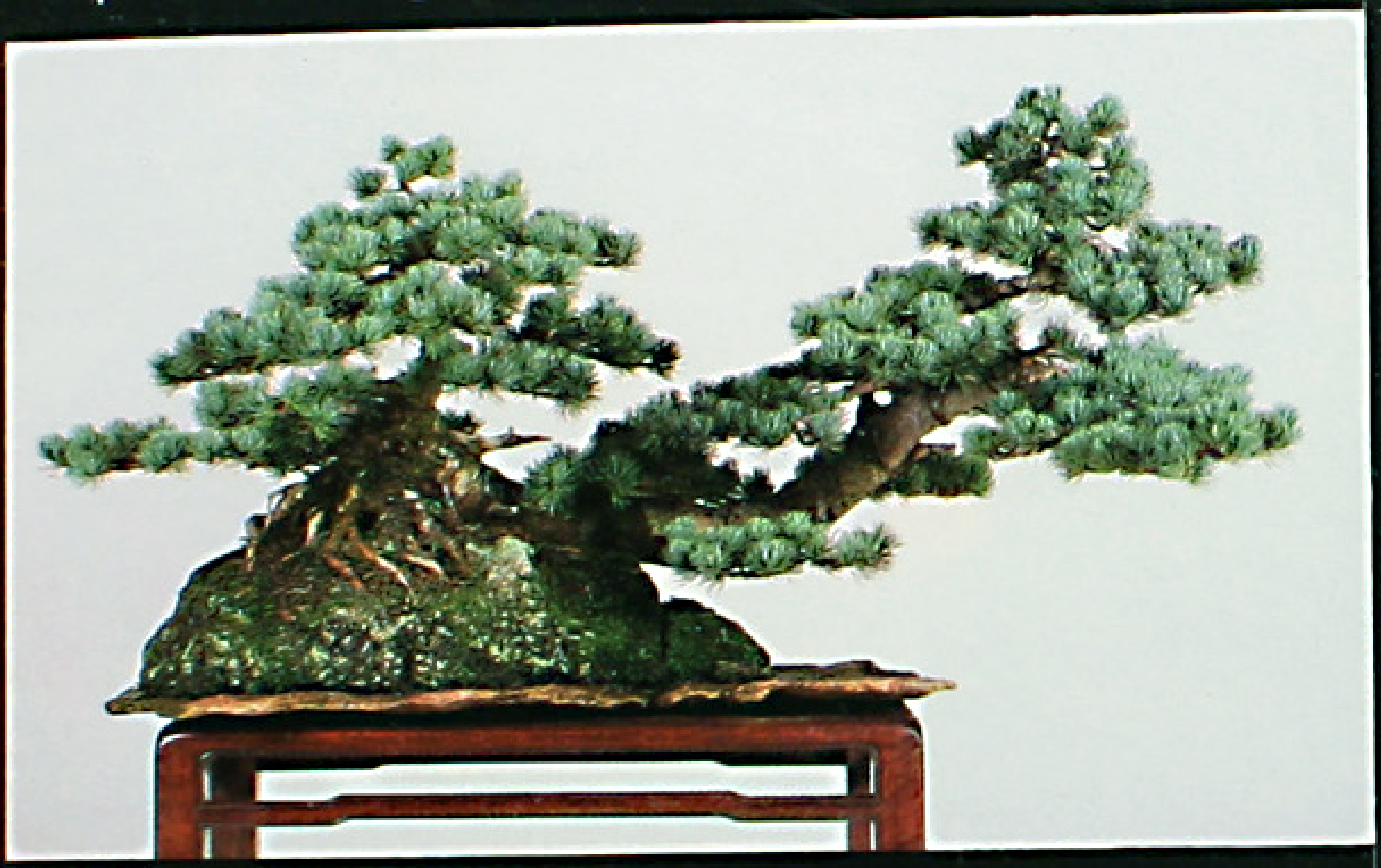


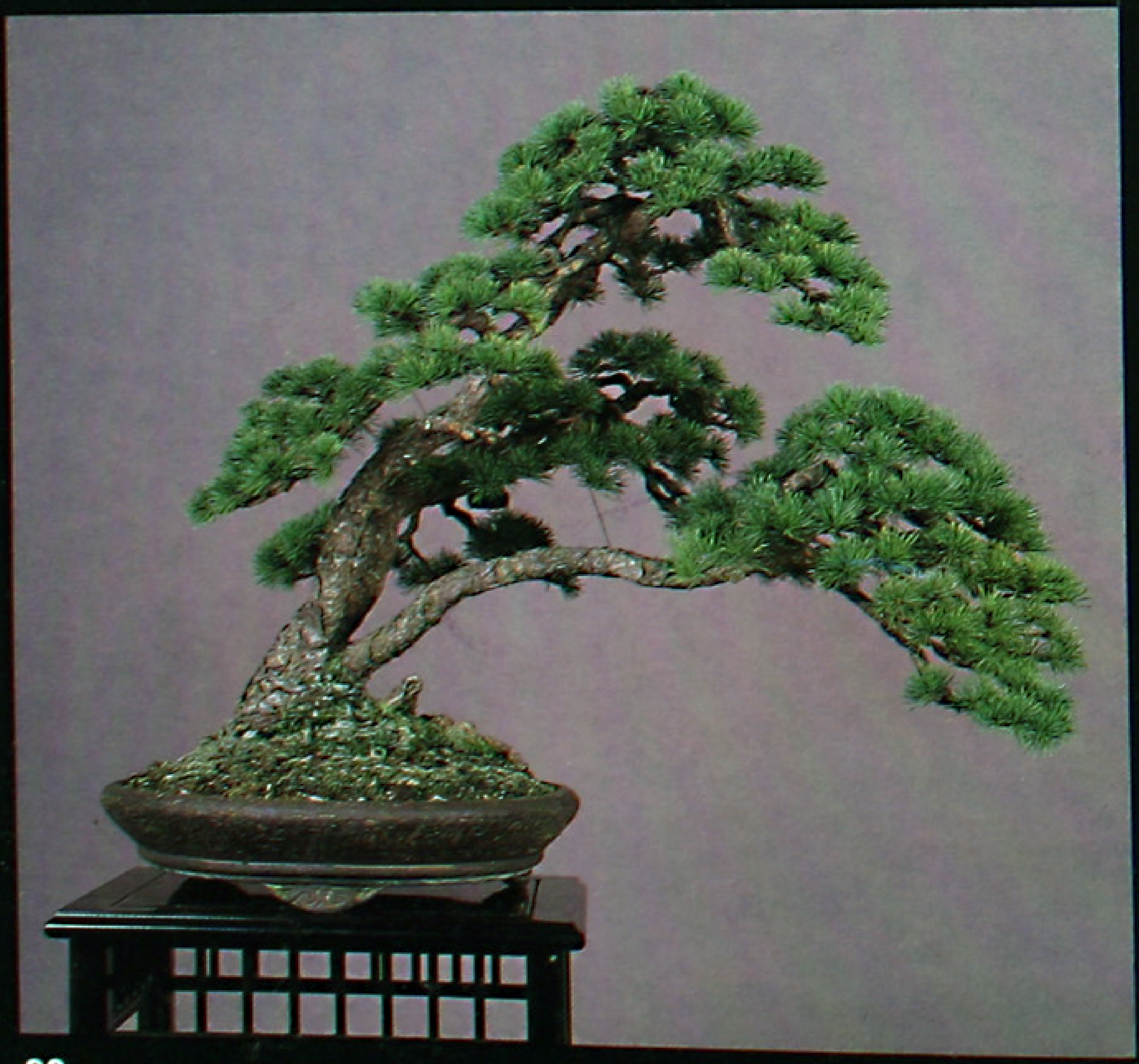
▲ **Five-needle pine. Height, from the apex to the cascading branch: 92 cm.**

▼ **Five-needle pine. Width: 64 cm.**

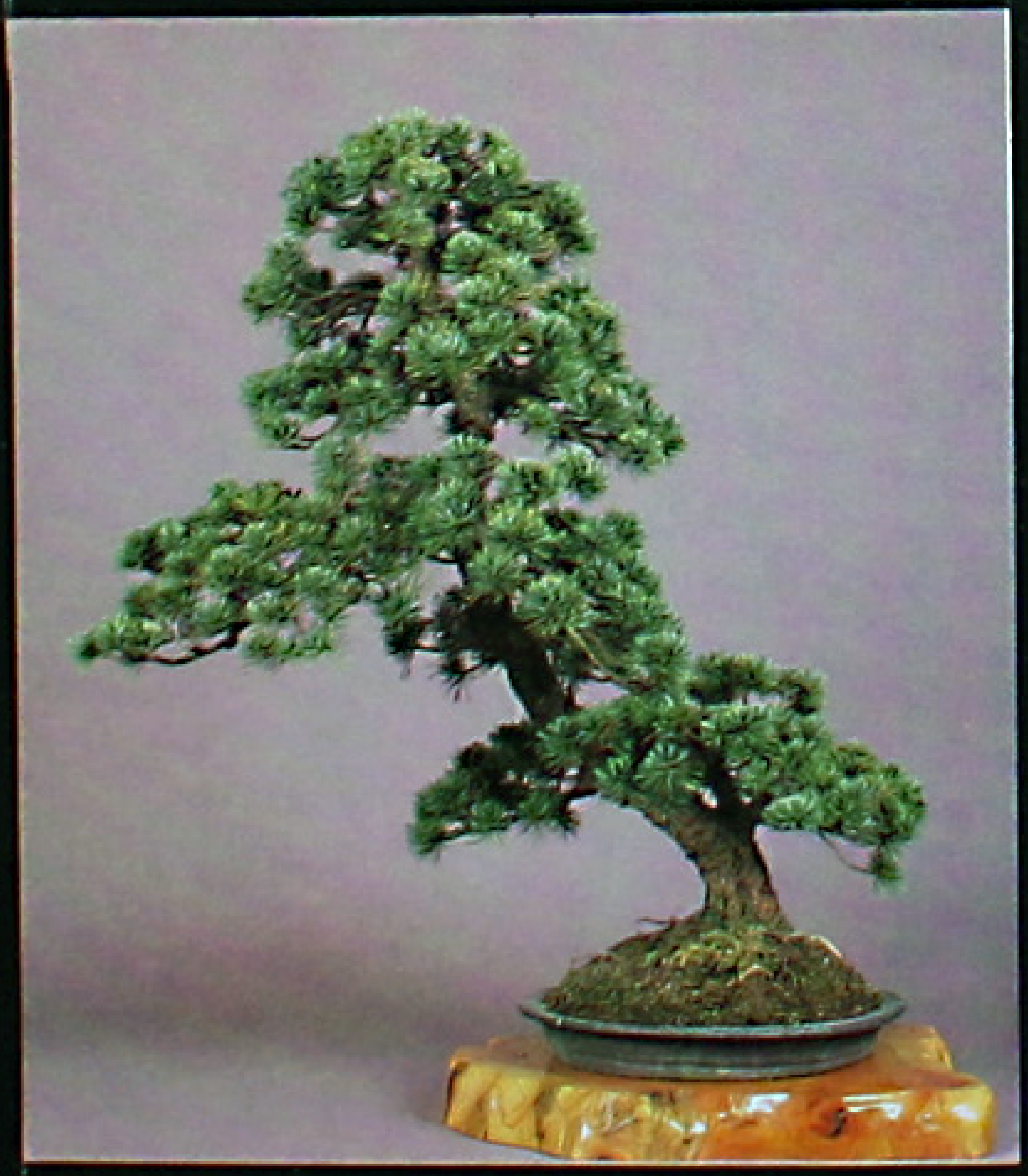


▼ **Five-needle pine. Width: 125 cm.**

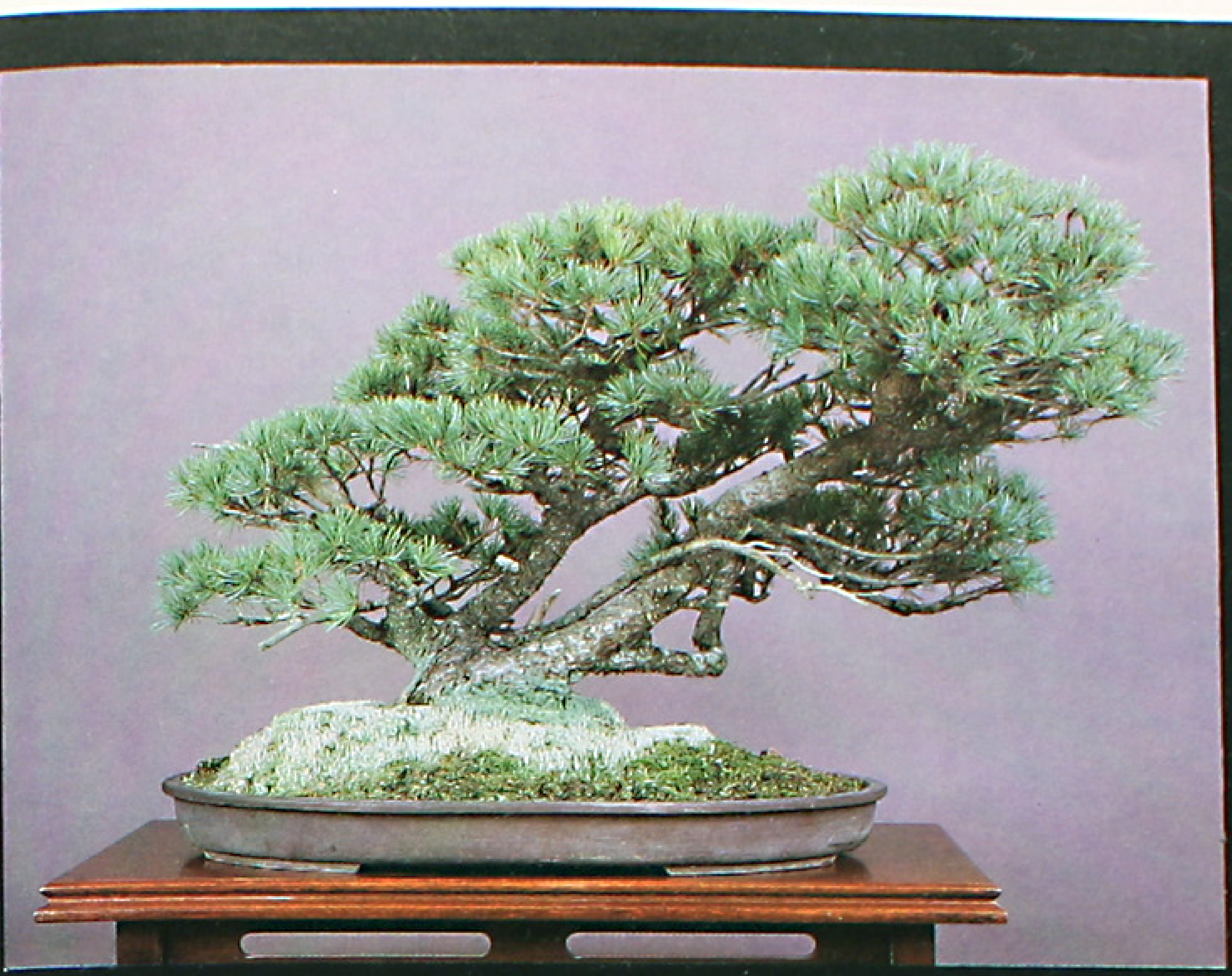




◀ **Five-needle pine. Height: 52 cm.**

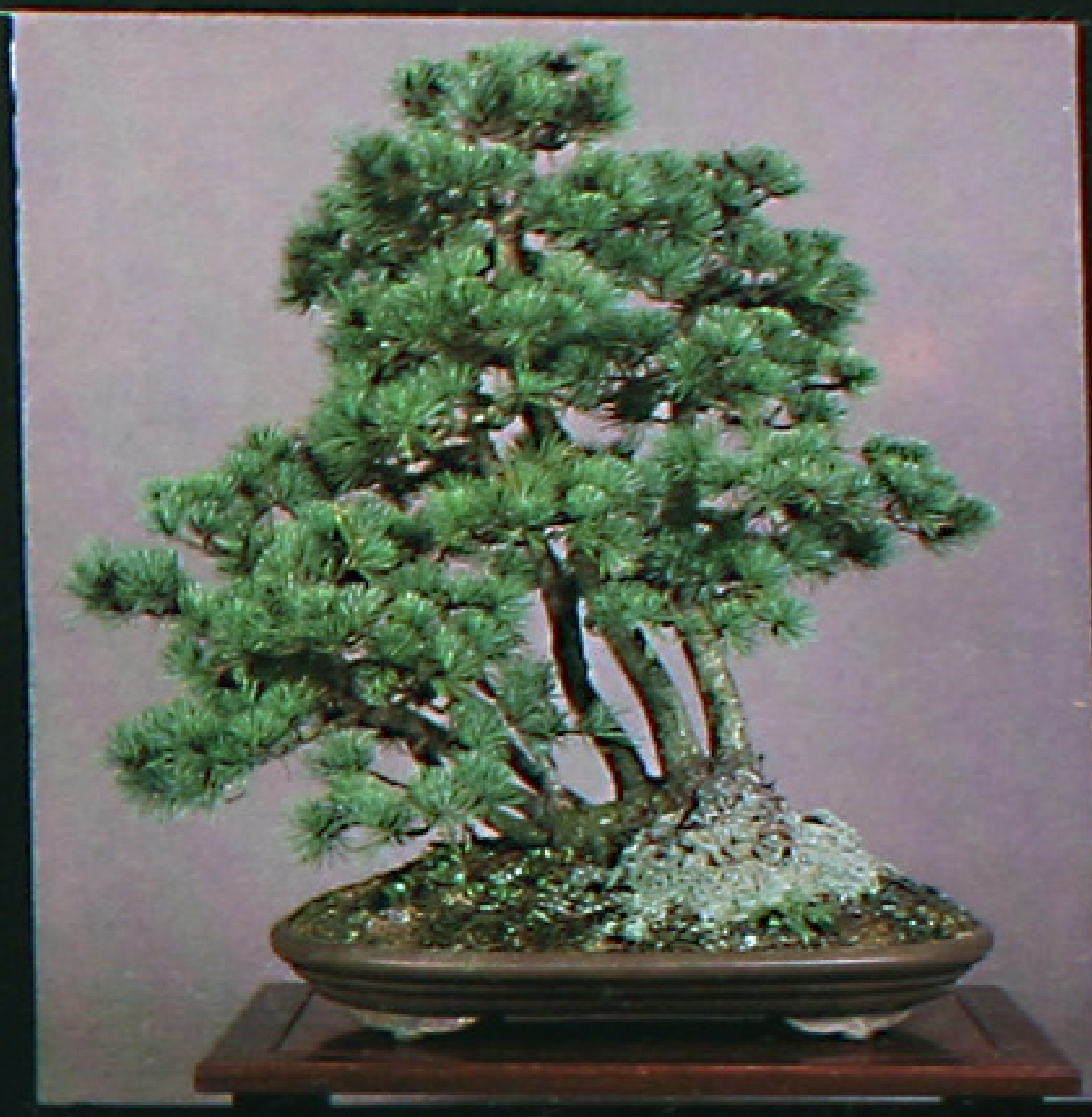


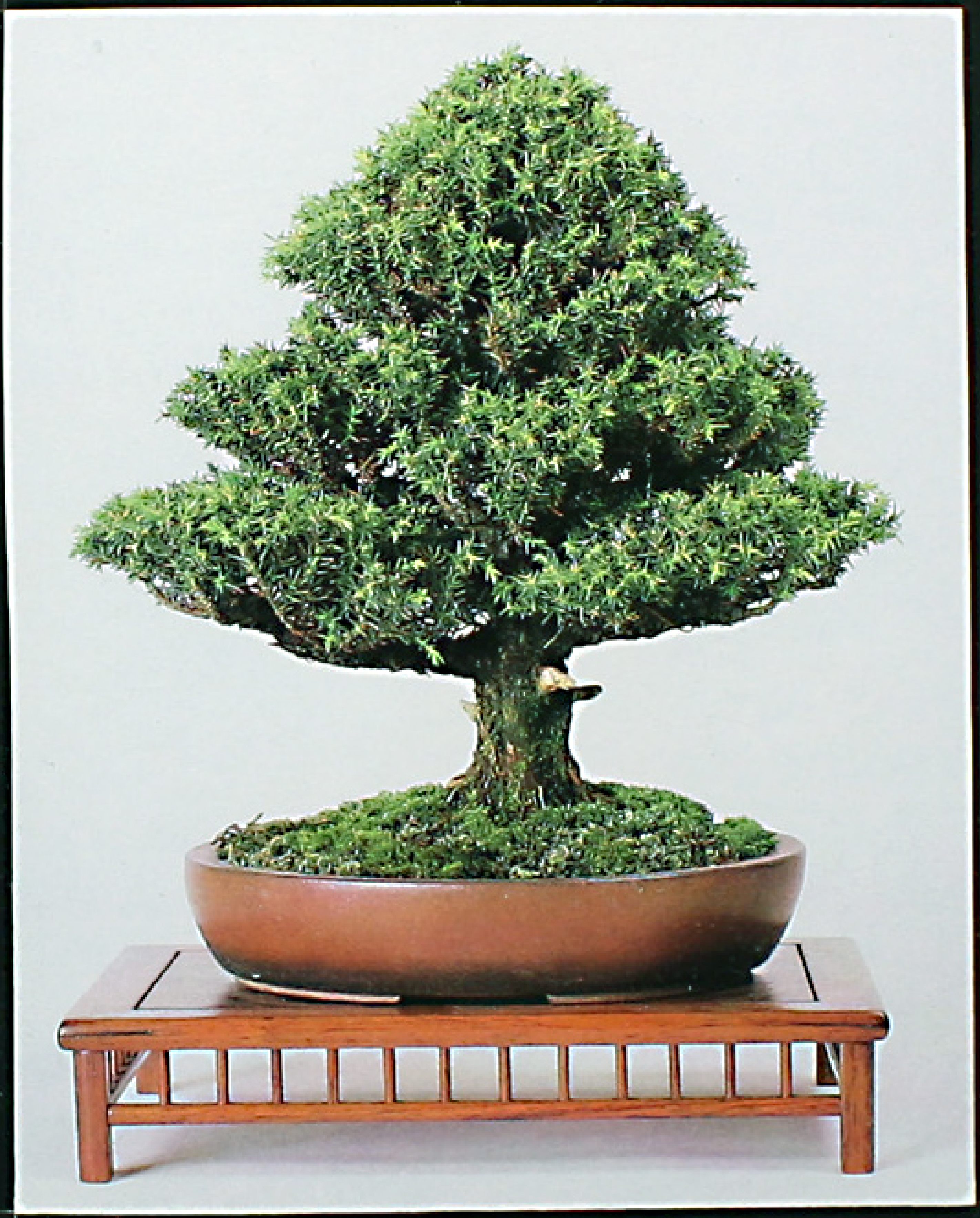
▲ **Five-needle pine. Height: 85 cm.**



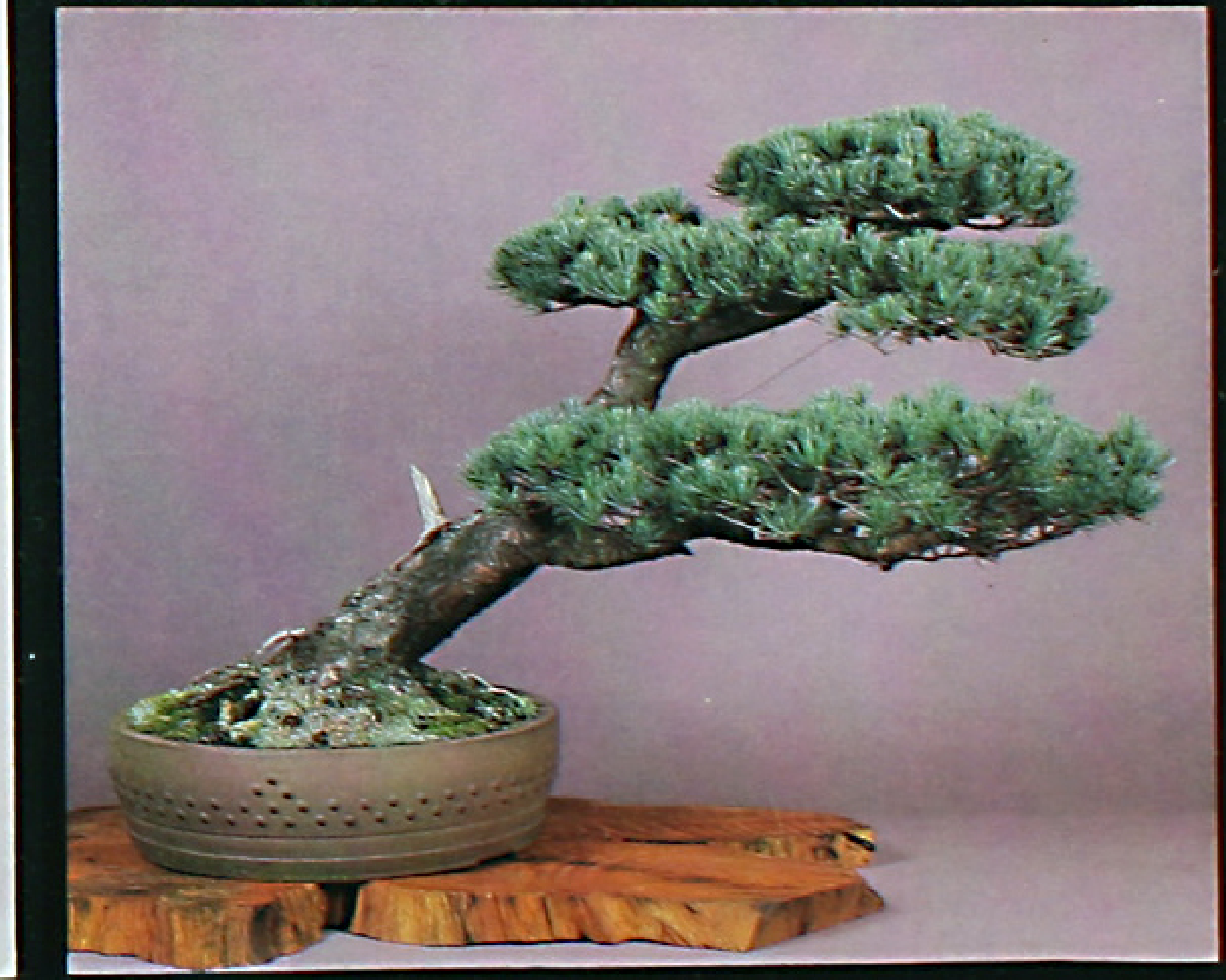
◀ Pinus parviflora. Height: 90 cm.

▼ Pinus parviflora. Height: 58 cm

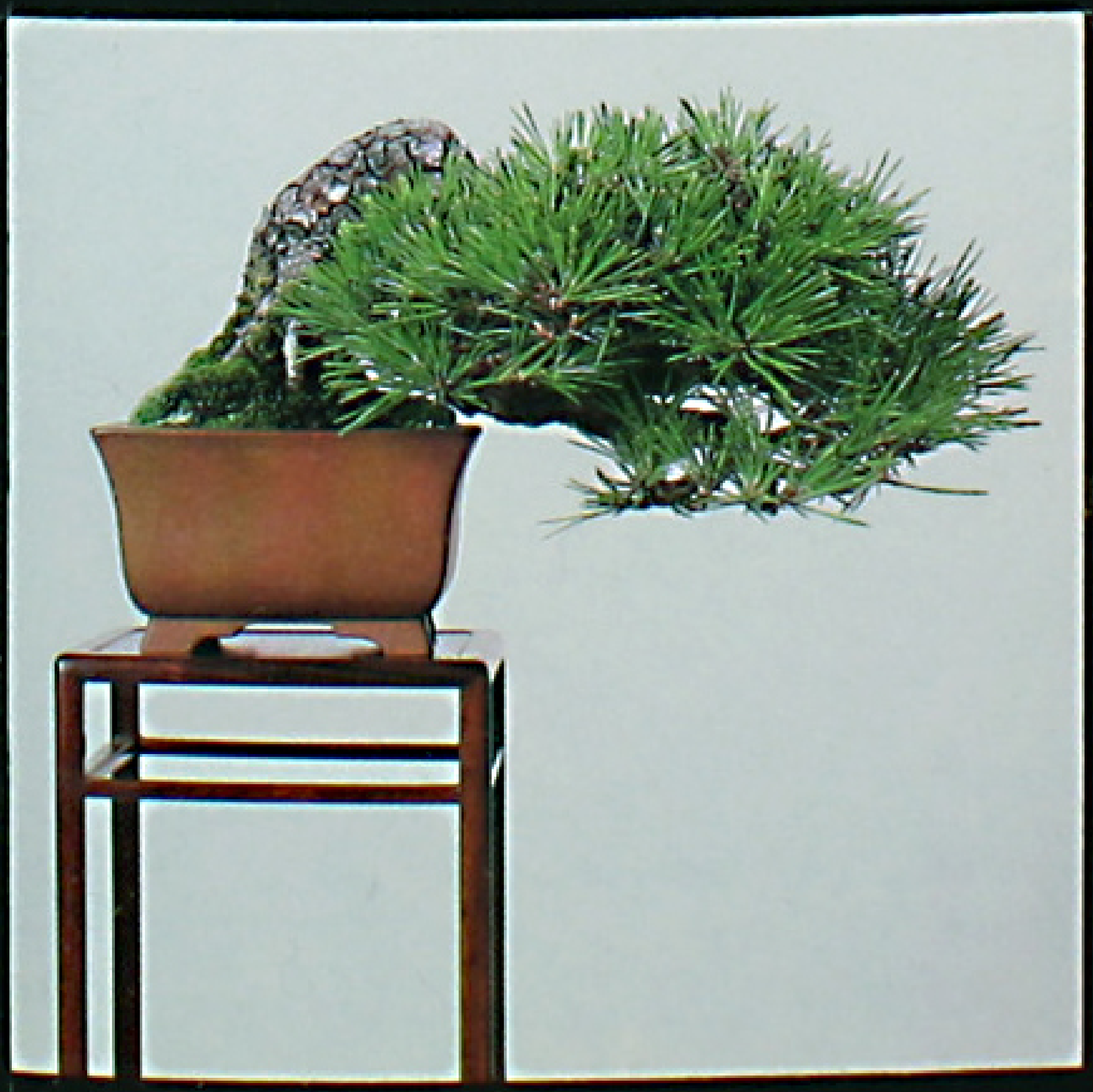




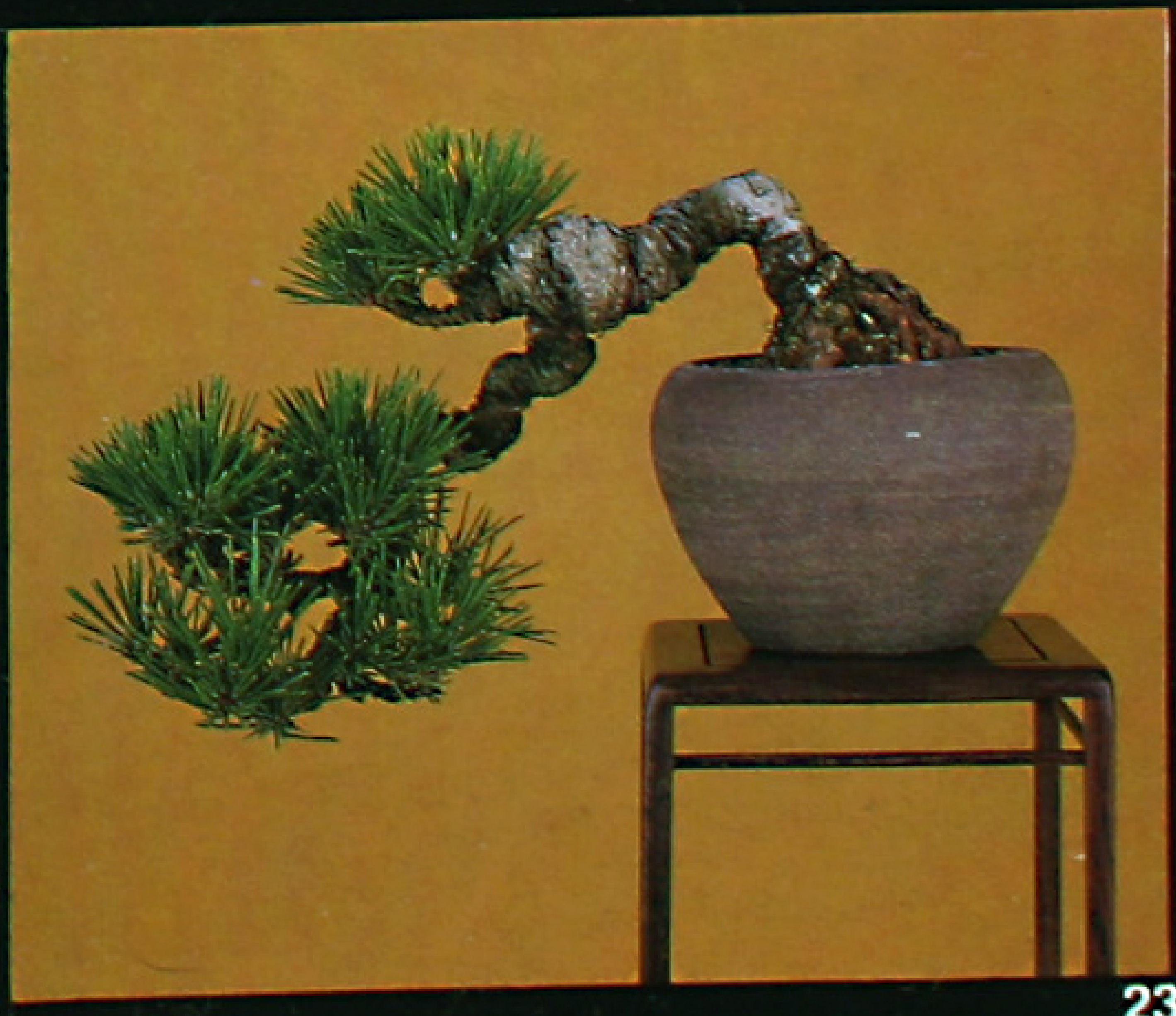
▲ Cryptomeria japonica. Height: 21 cm.



▲ Pinus parviflora. Height: 92 cm.

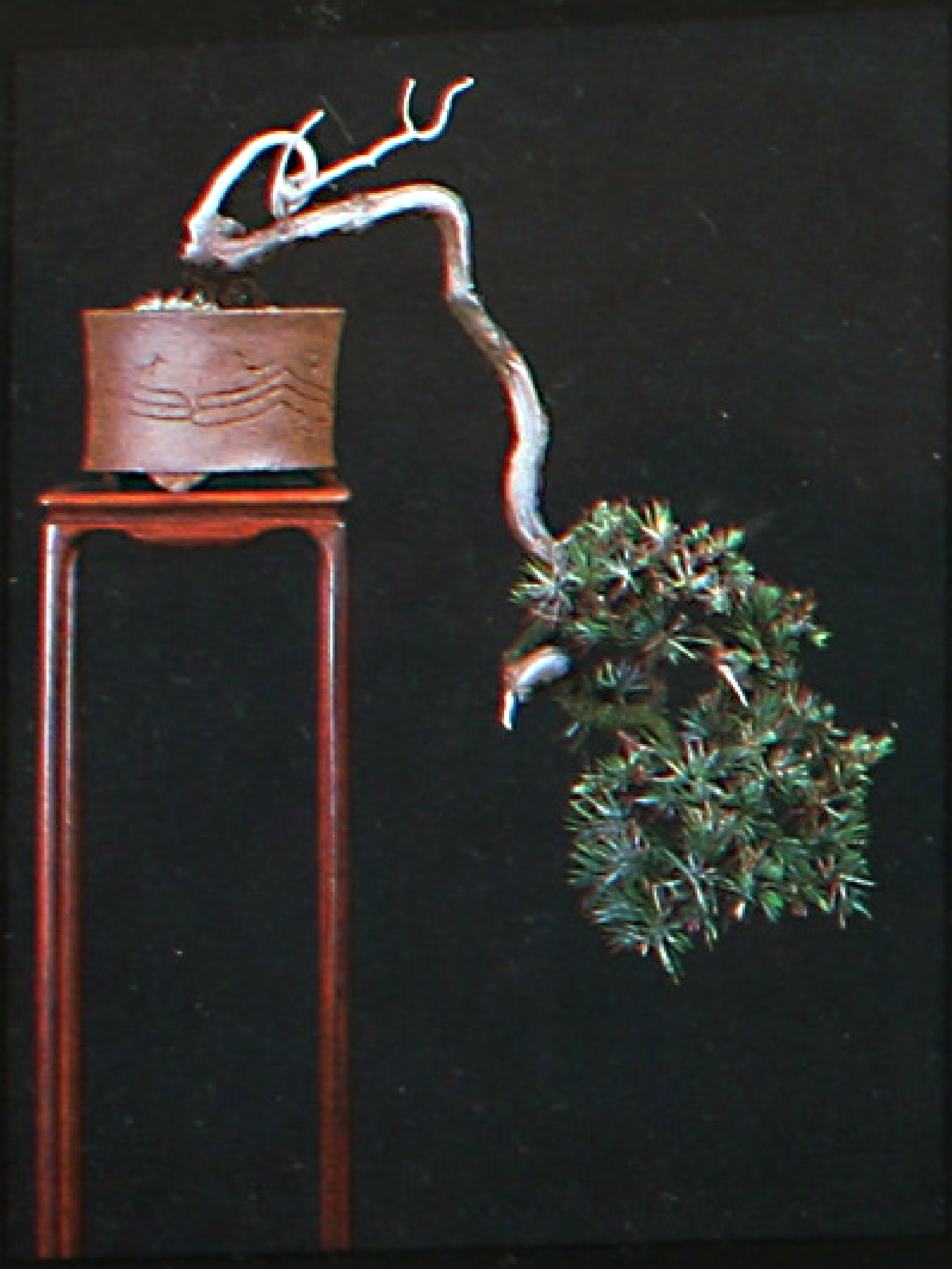


◀ Pinus thunbergii. Height: 21 cm.



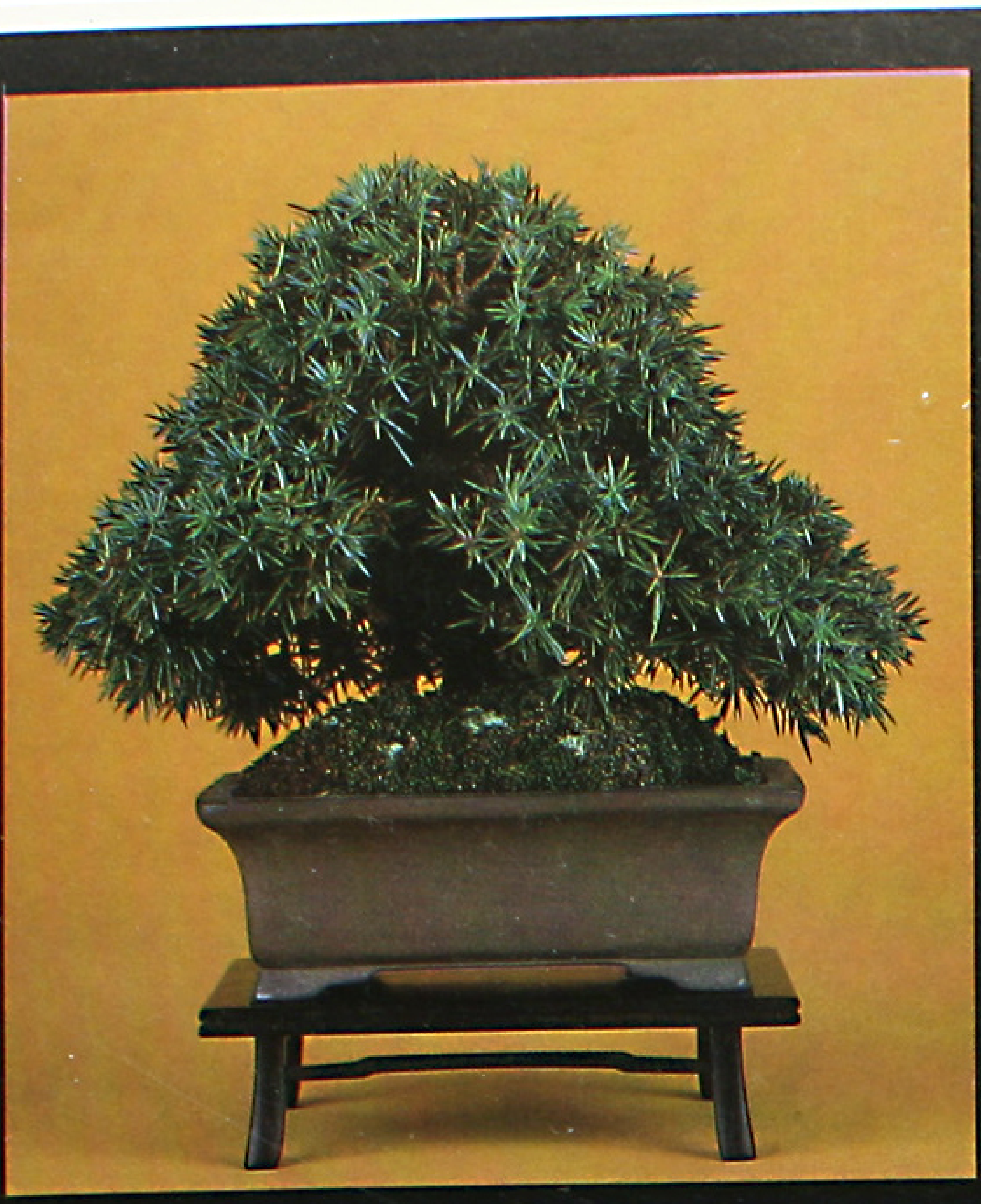
▶ Pinus thunbergii. Height: 18 cm.

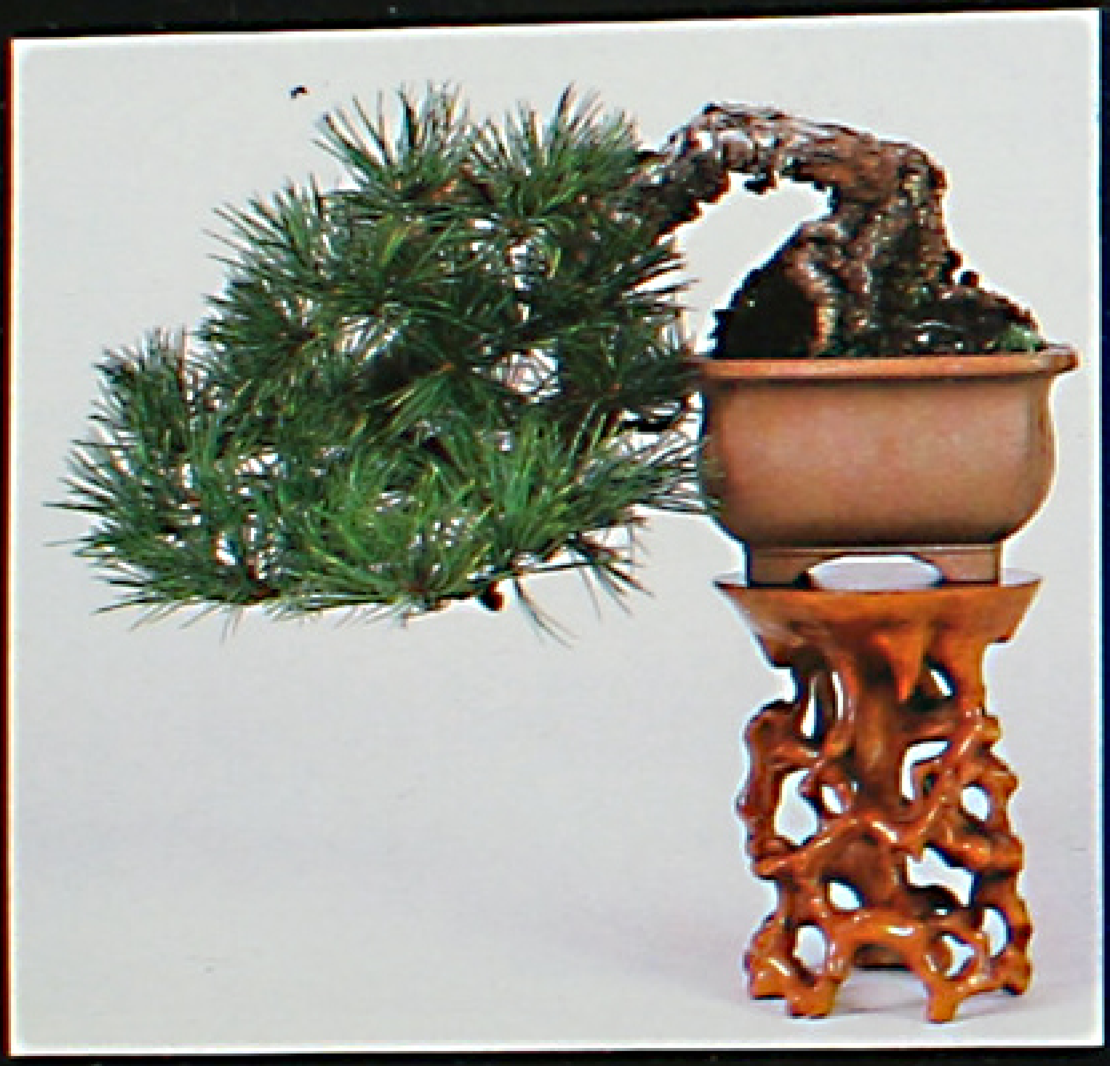
GALLERY



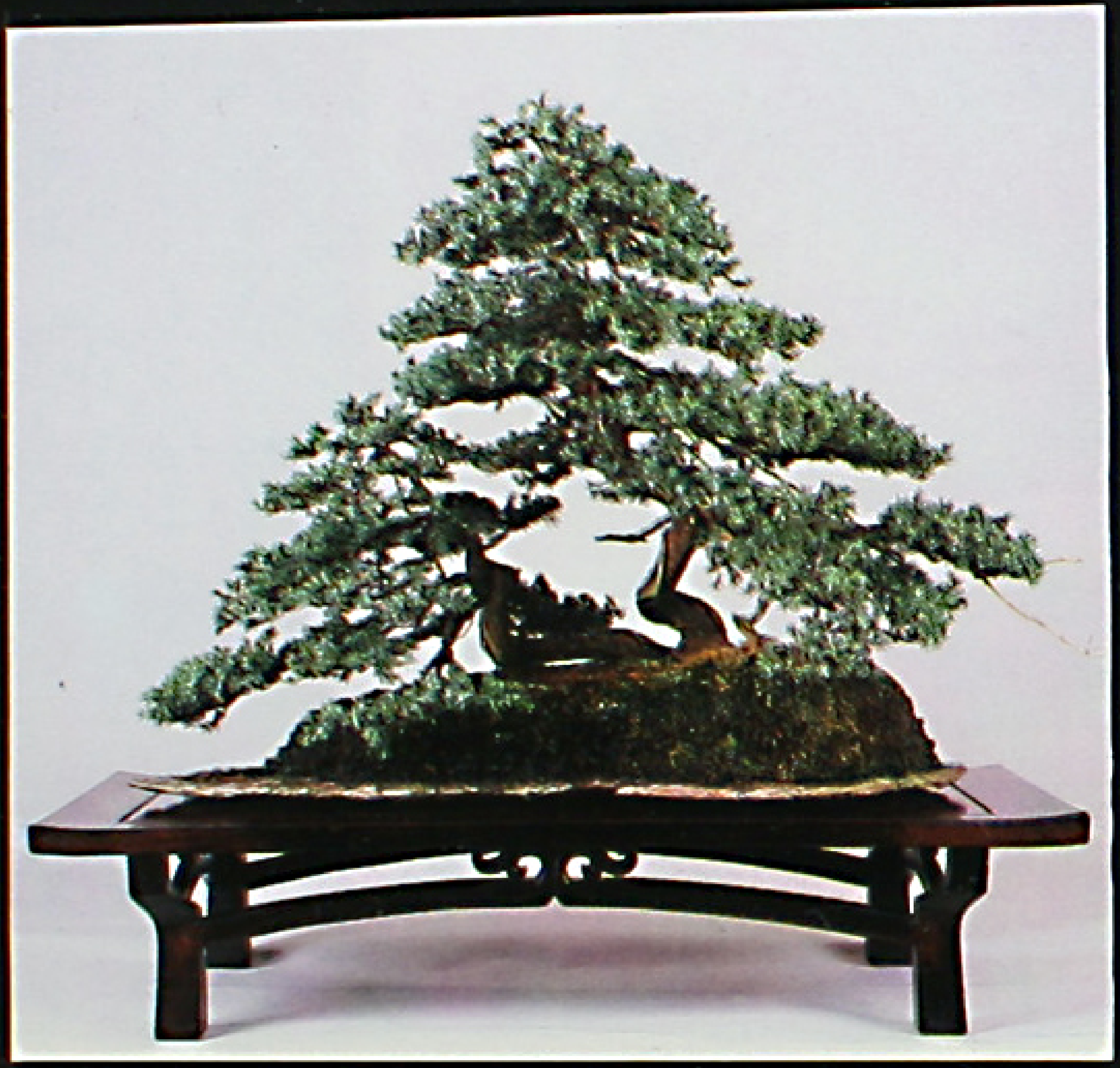
◀ Juniperus rigida.
Height: 22 cm.

▶ Juniperus rigida.
Height: 12.5 cm.

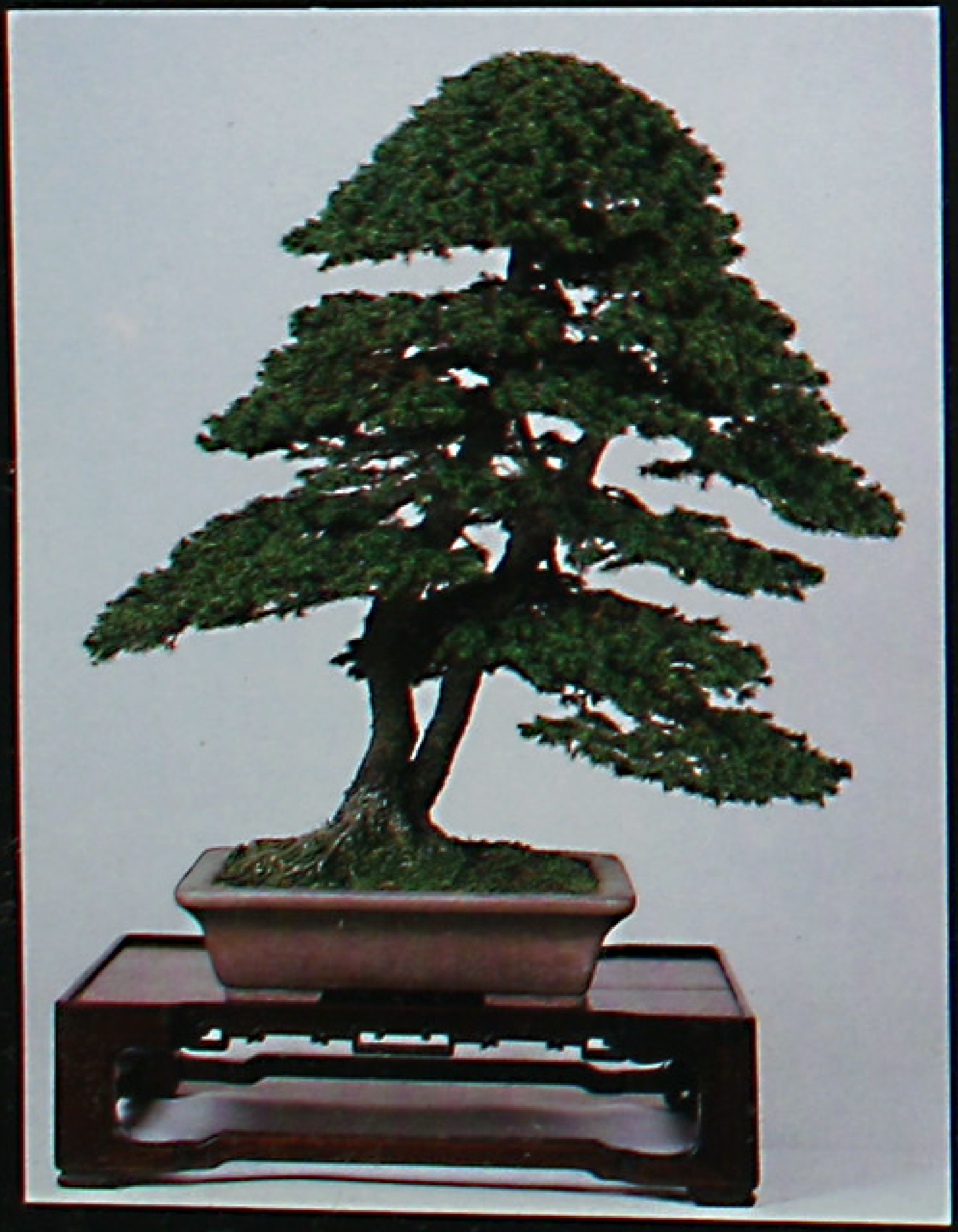




◀◀ Pinus thunbergii.
Height: 14 cm.

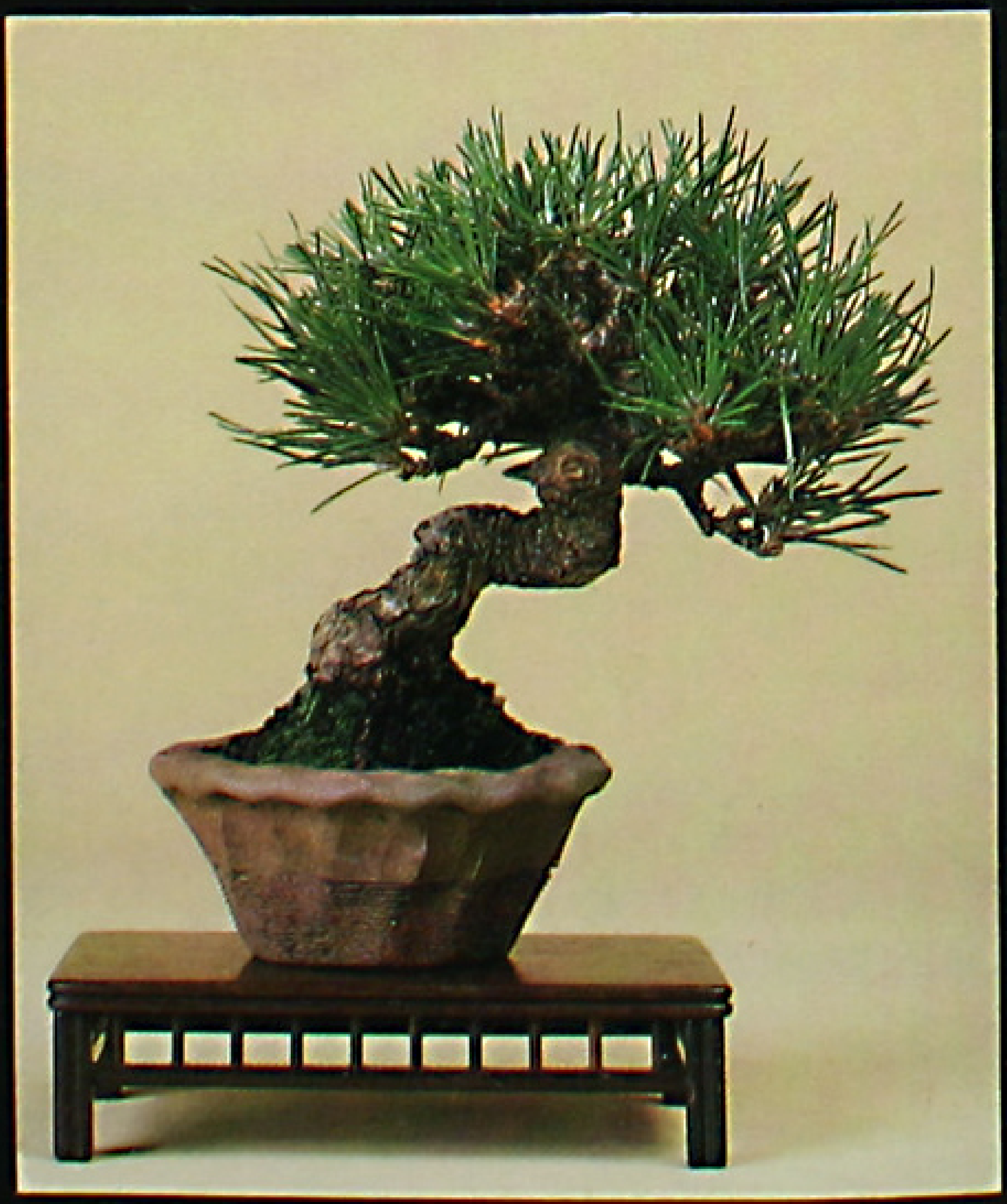


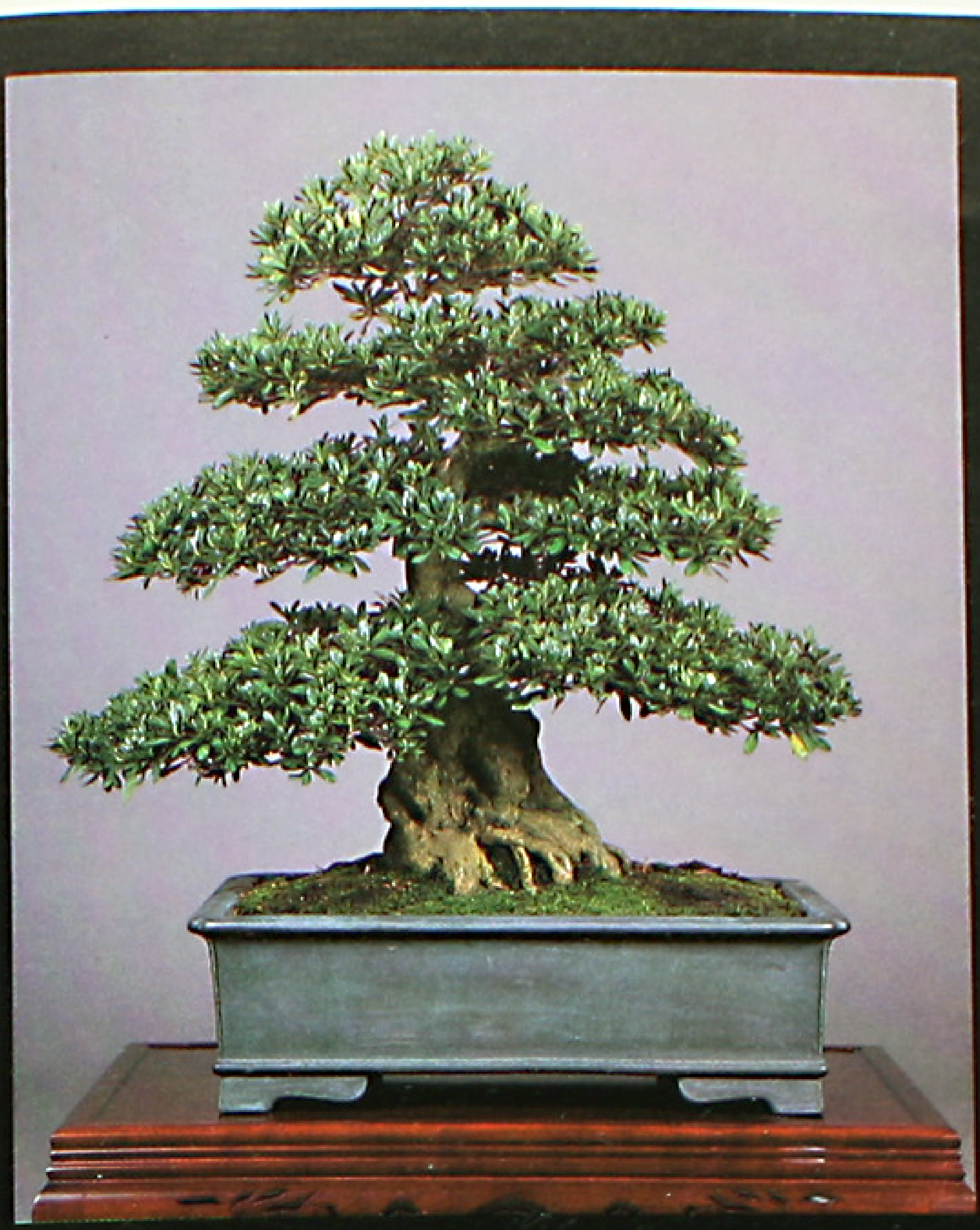
◀ Juniperus rigida.
Height: 51 cm.



◀ Picea glehni.
Height: 80 cm.

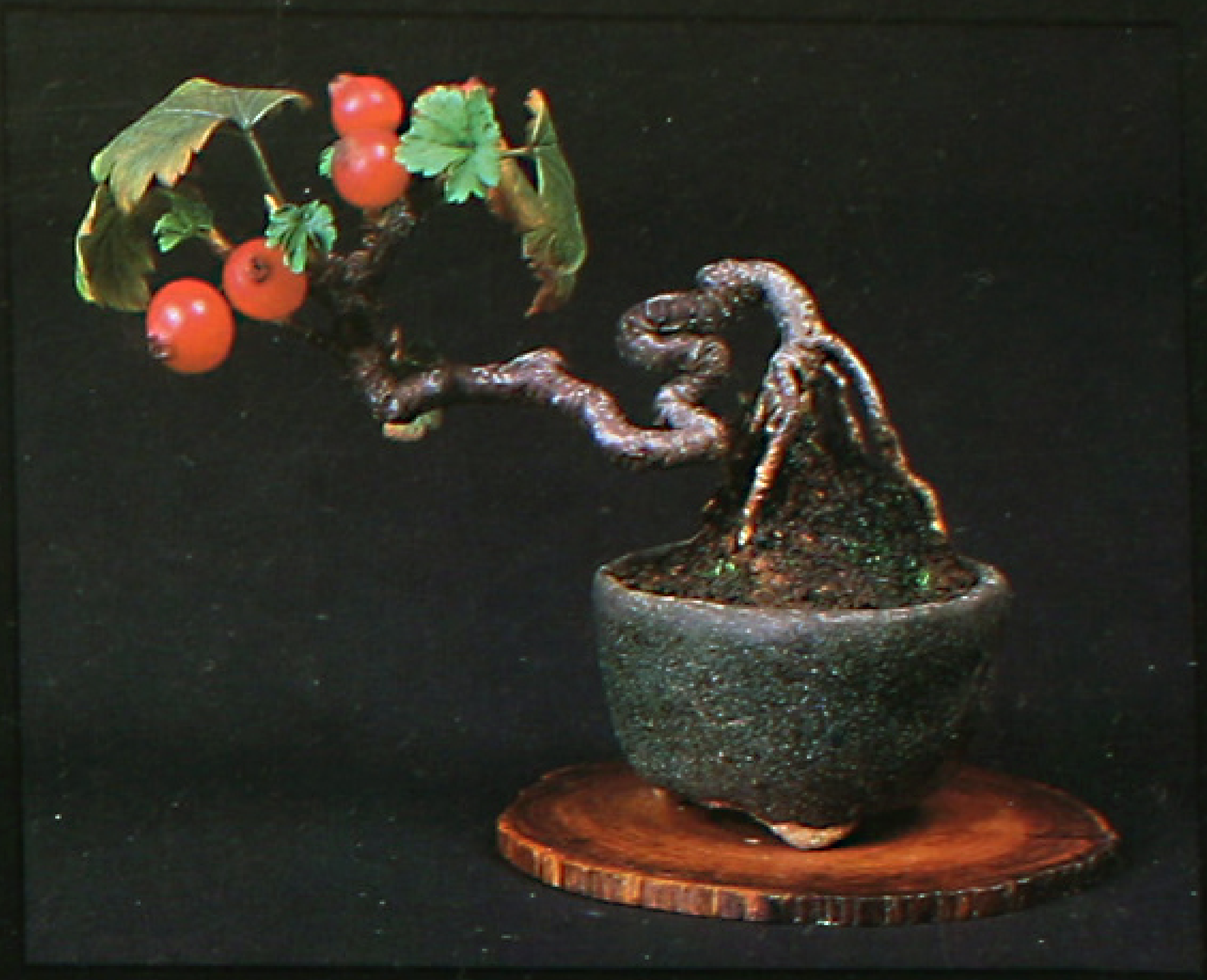
▶ Pinus thunbergii.
Height: 12 cm.

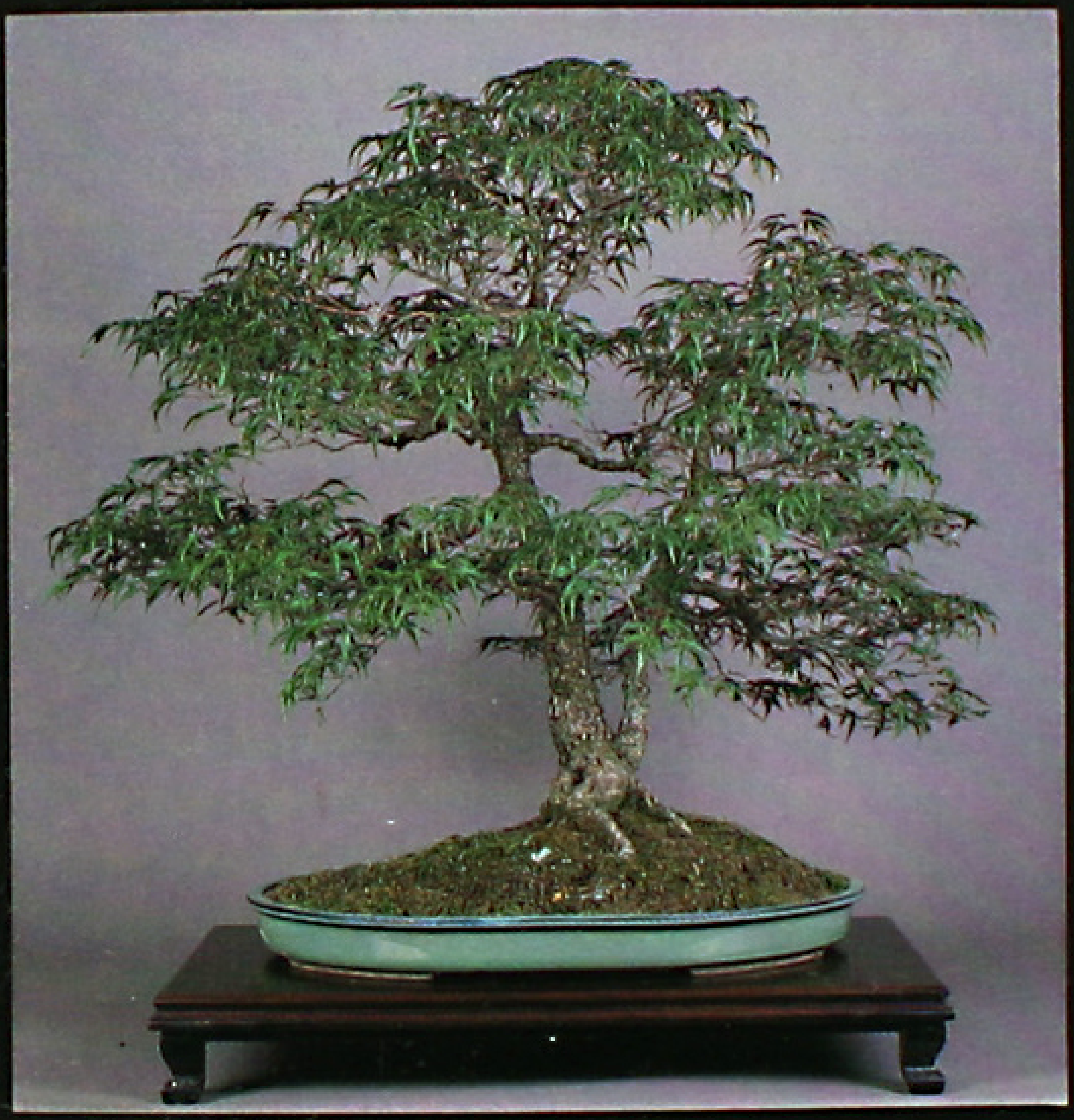




◀ **Rhododendron Simsii. Height: 54 cm.**

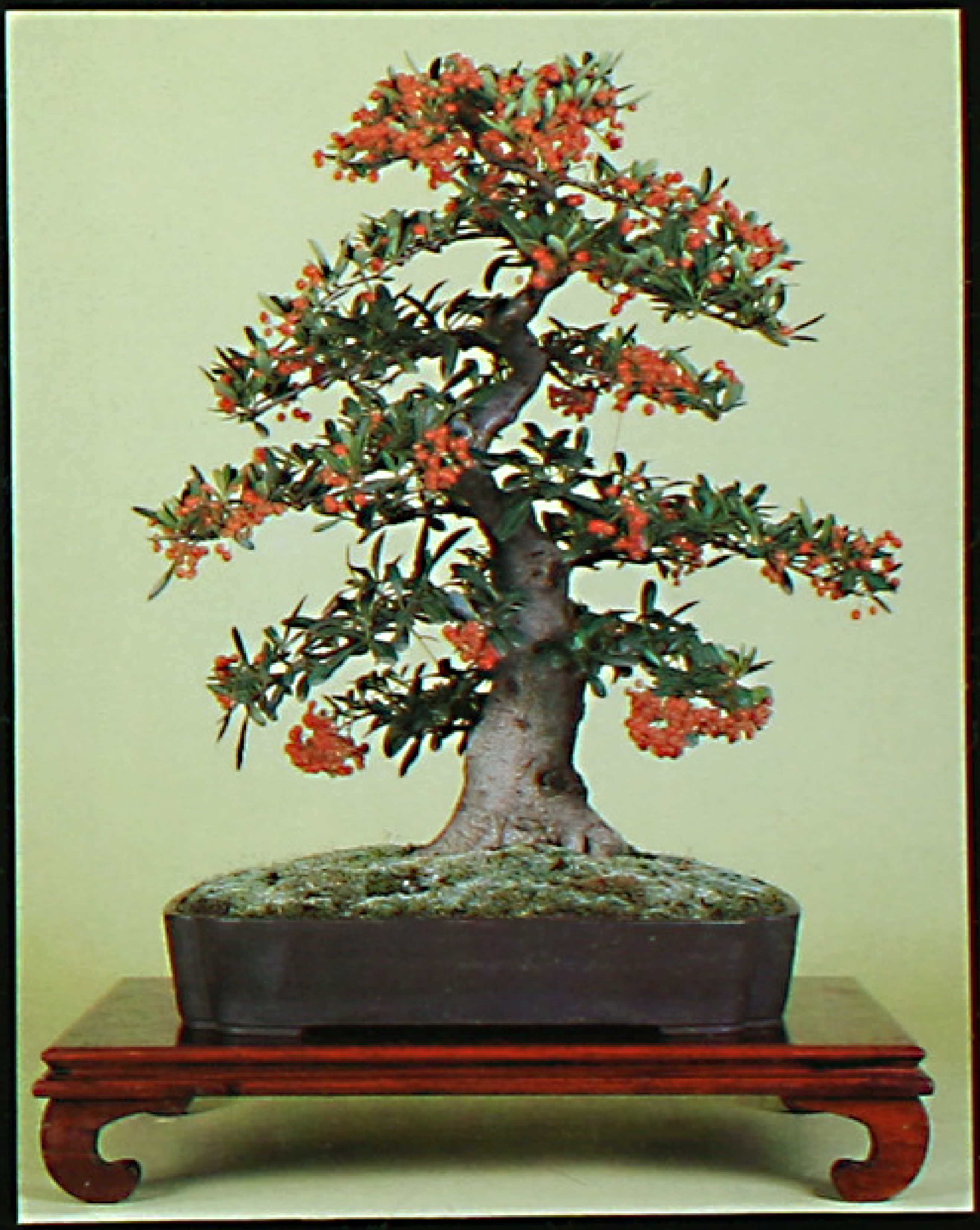
▼ **Ribes rubrum.**

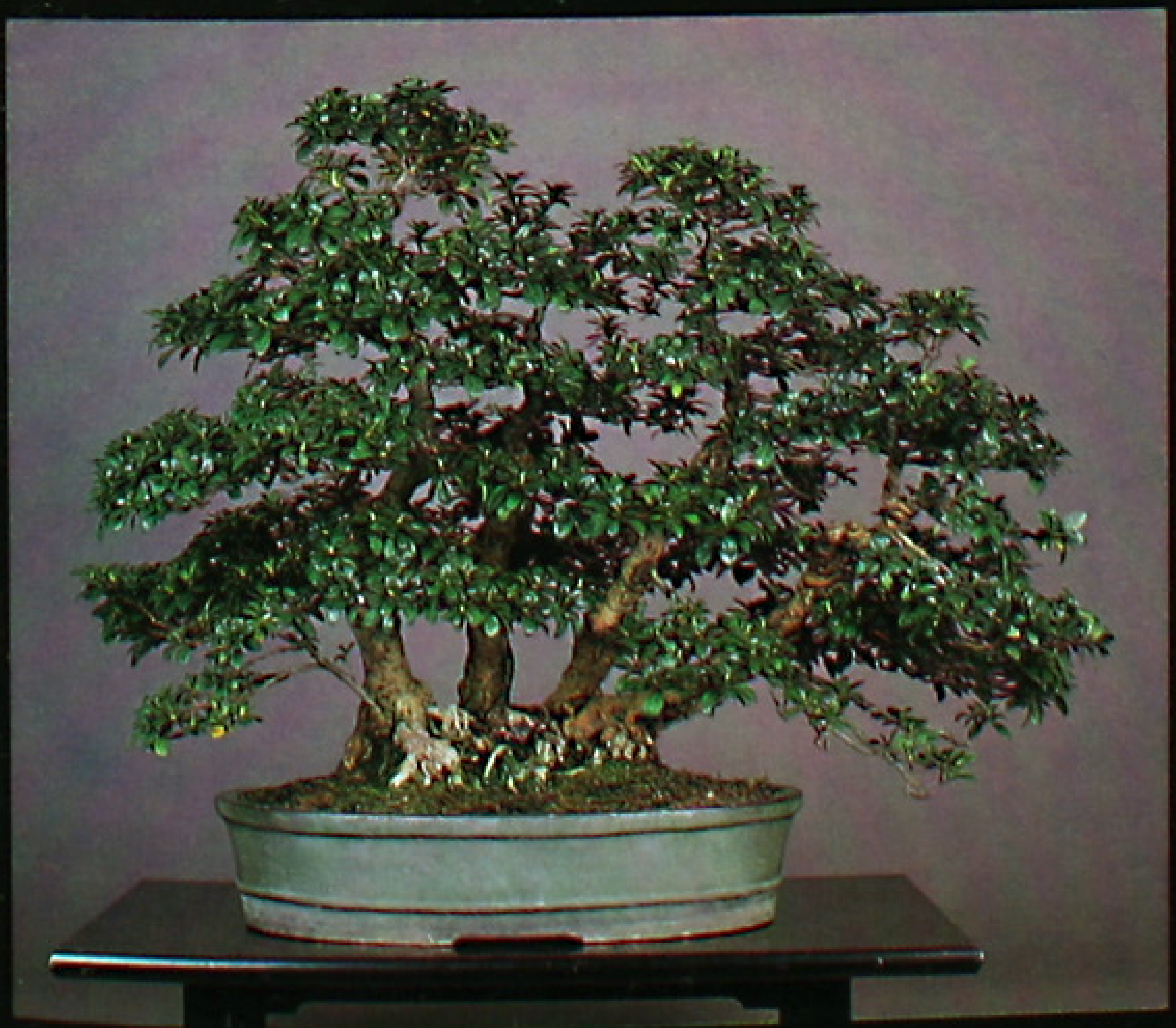




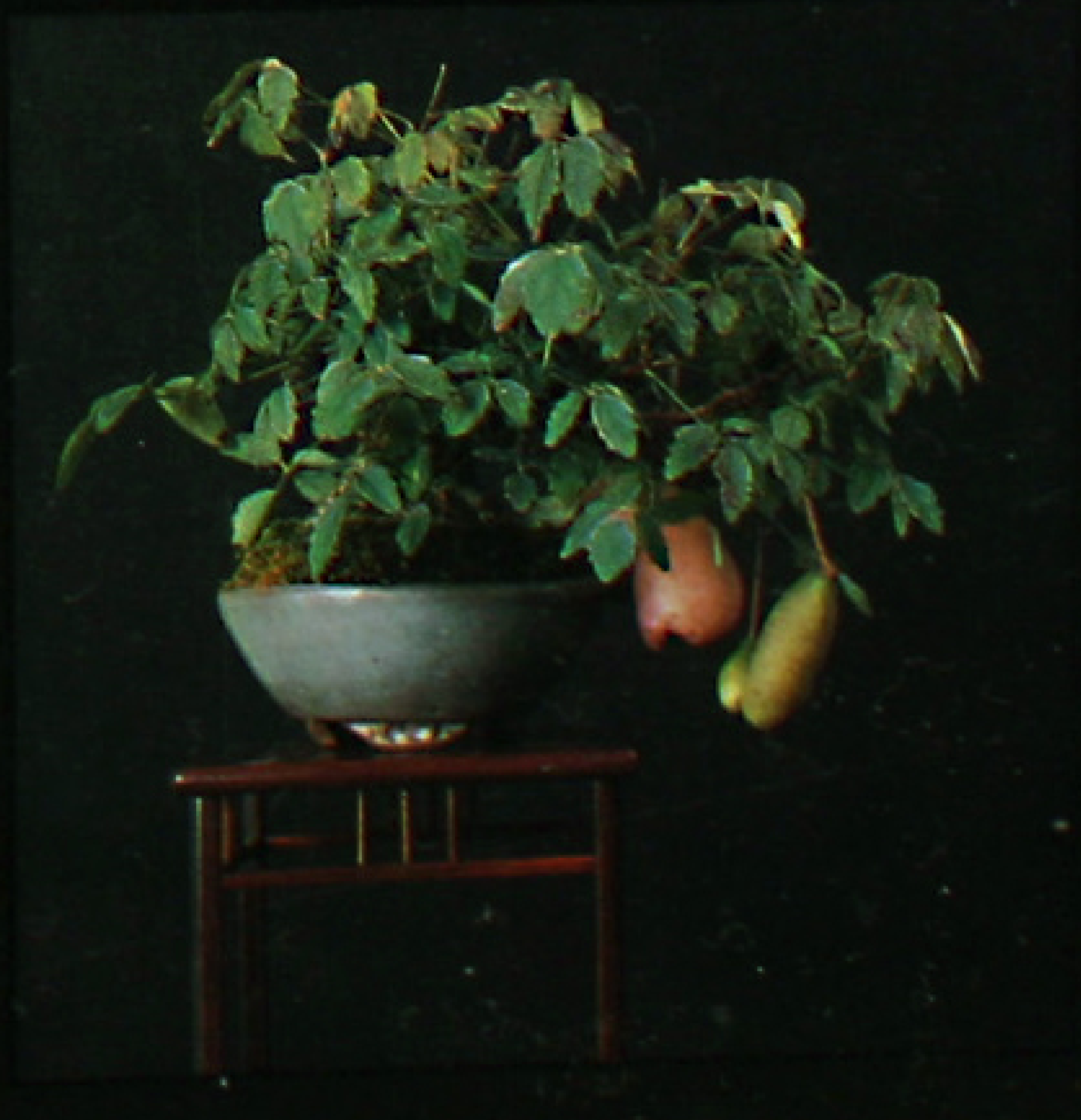
◀ **Acer palmatum ssp. Matsumurae. Height: 75 cm.**

▶ **Pyracantha cv. Duvalii. Height: 55 cm.**





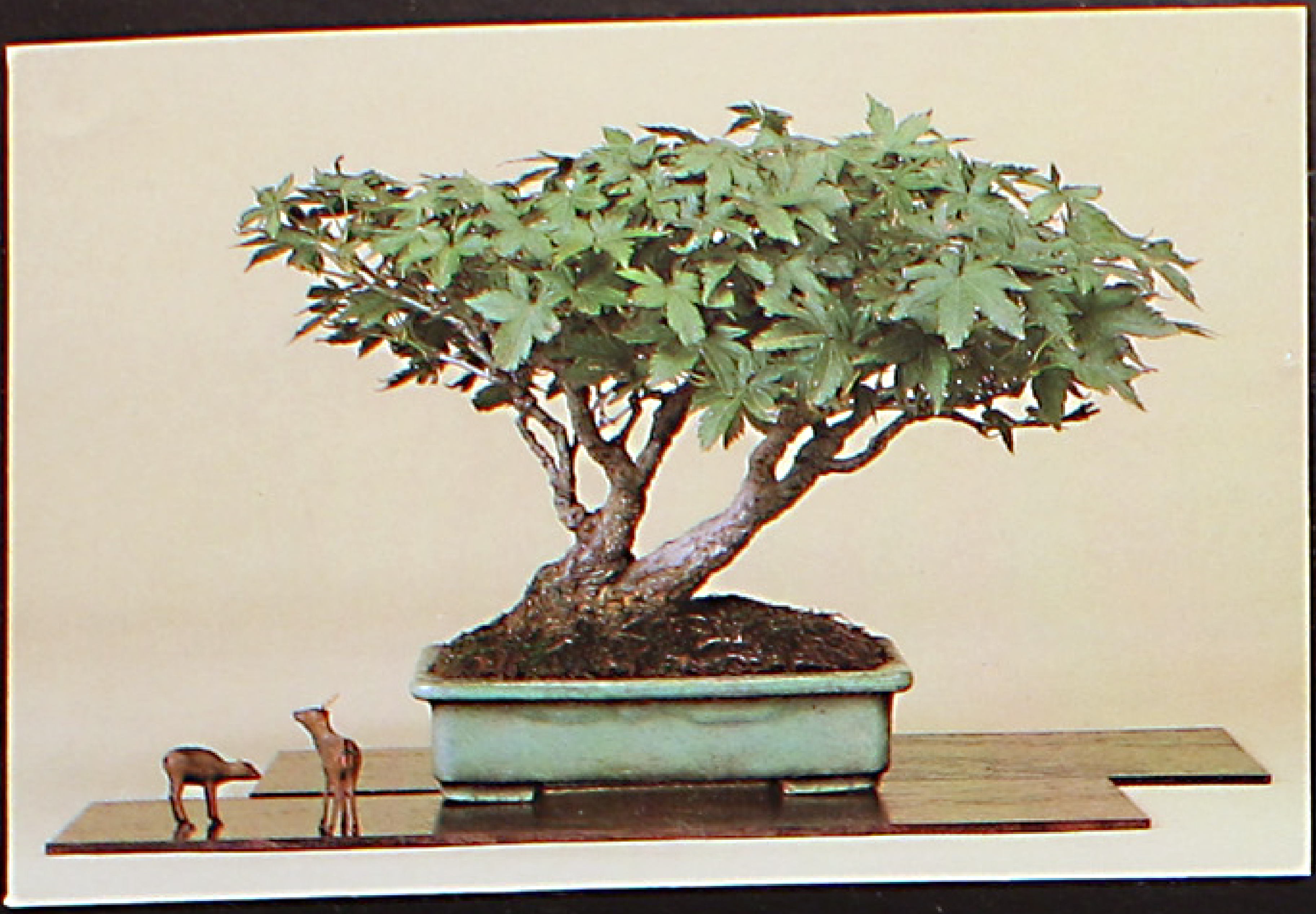
◀◀ **Rhododendron indicum. Height: 57 cm.**

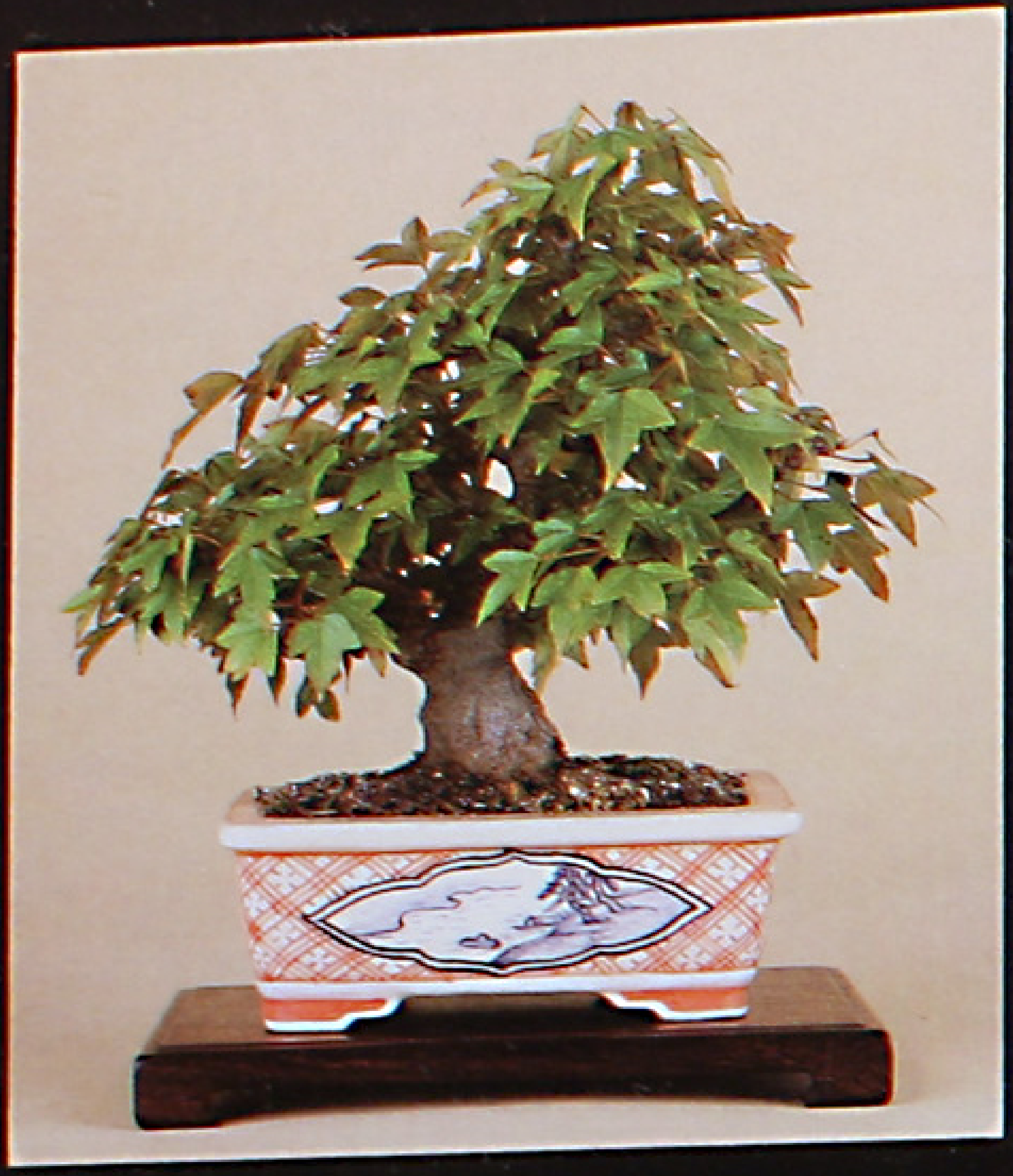


◀ **Ribes fasciculatum.**

GALLERY

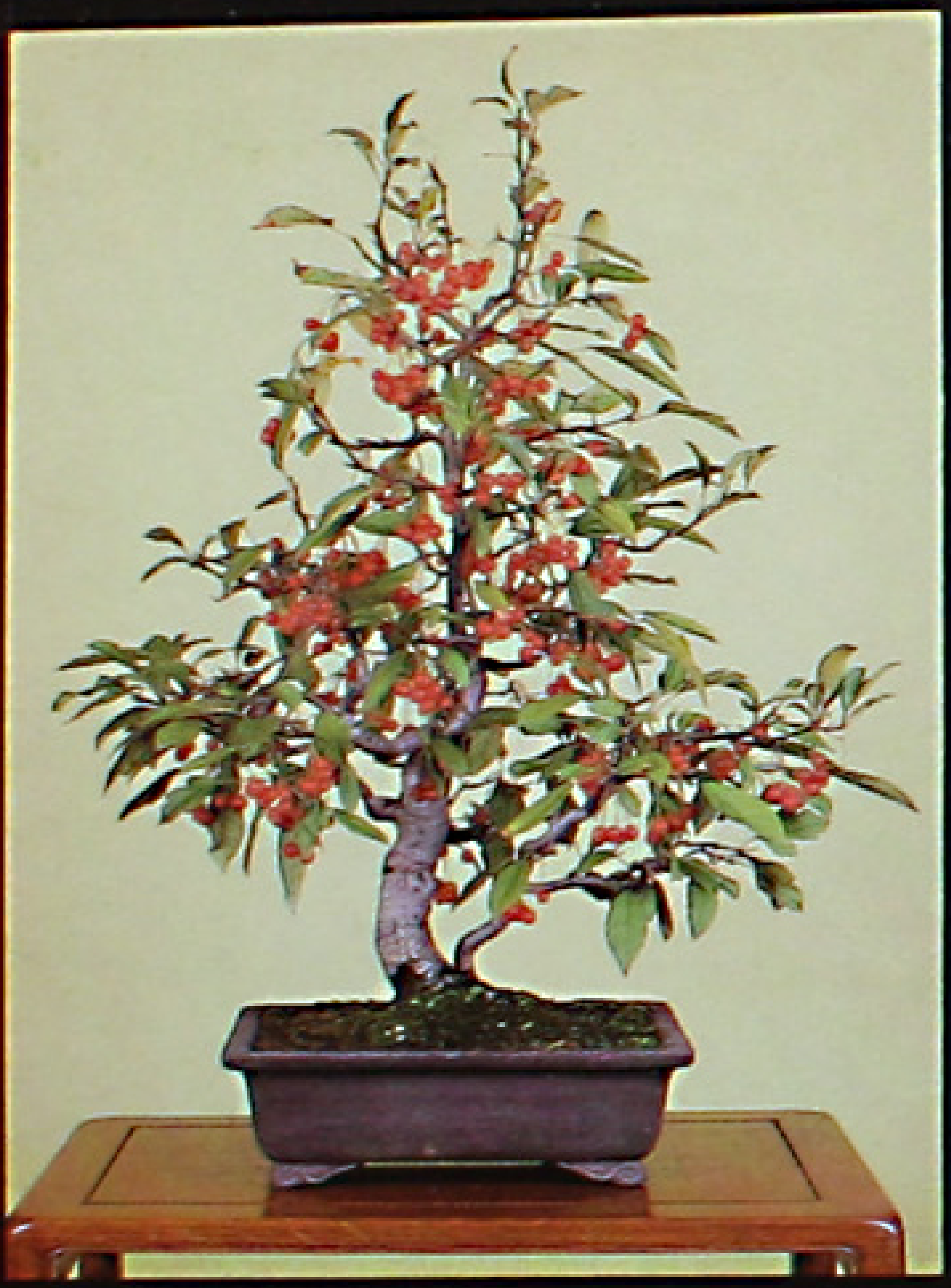
Acer palmatum. Height: 10 cm. ▶

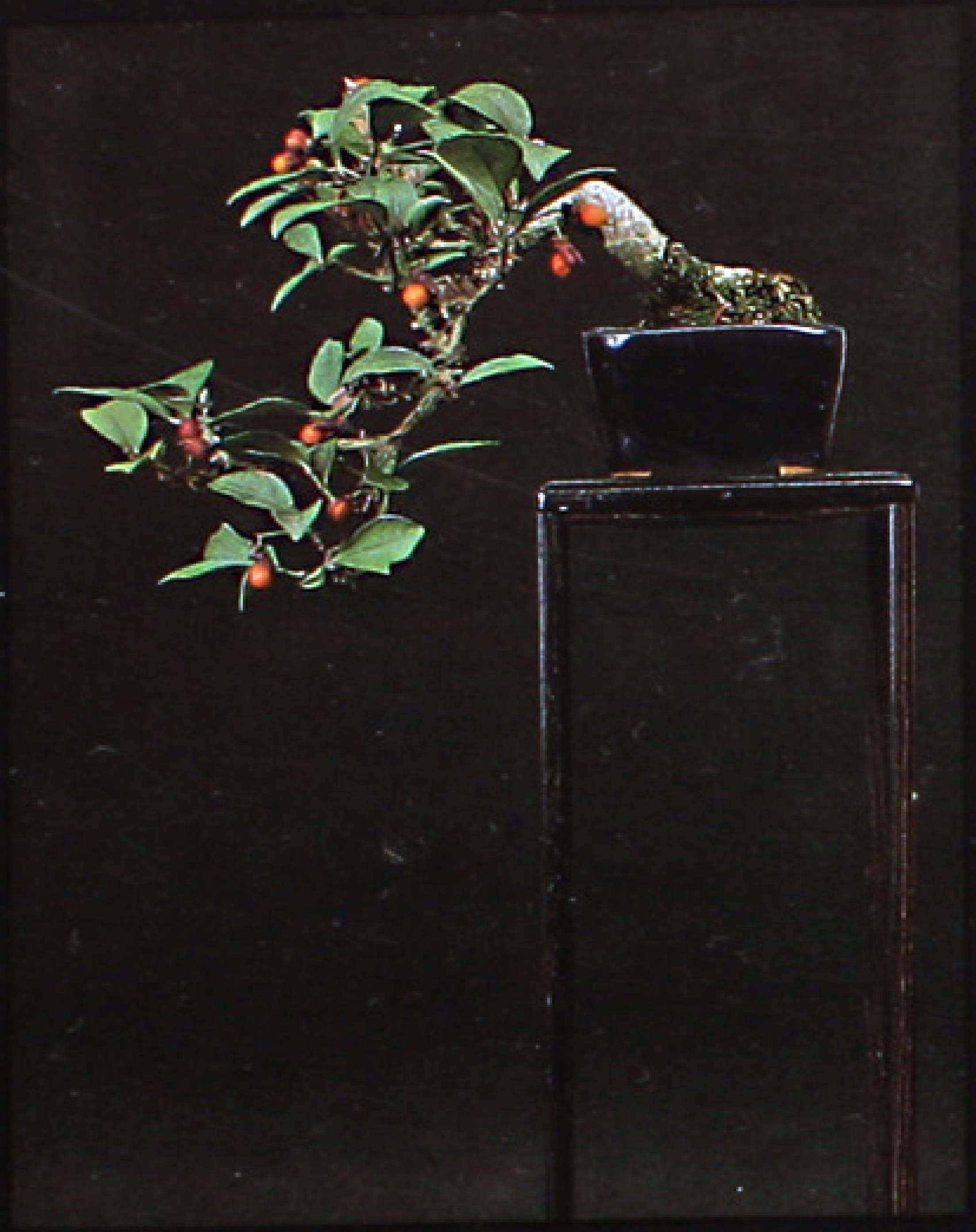




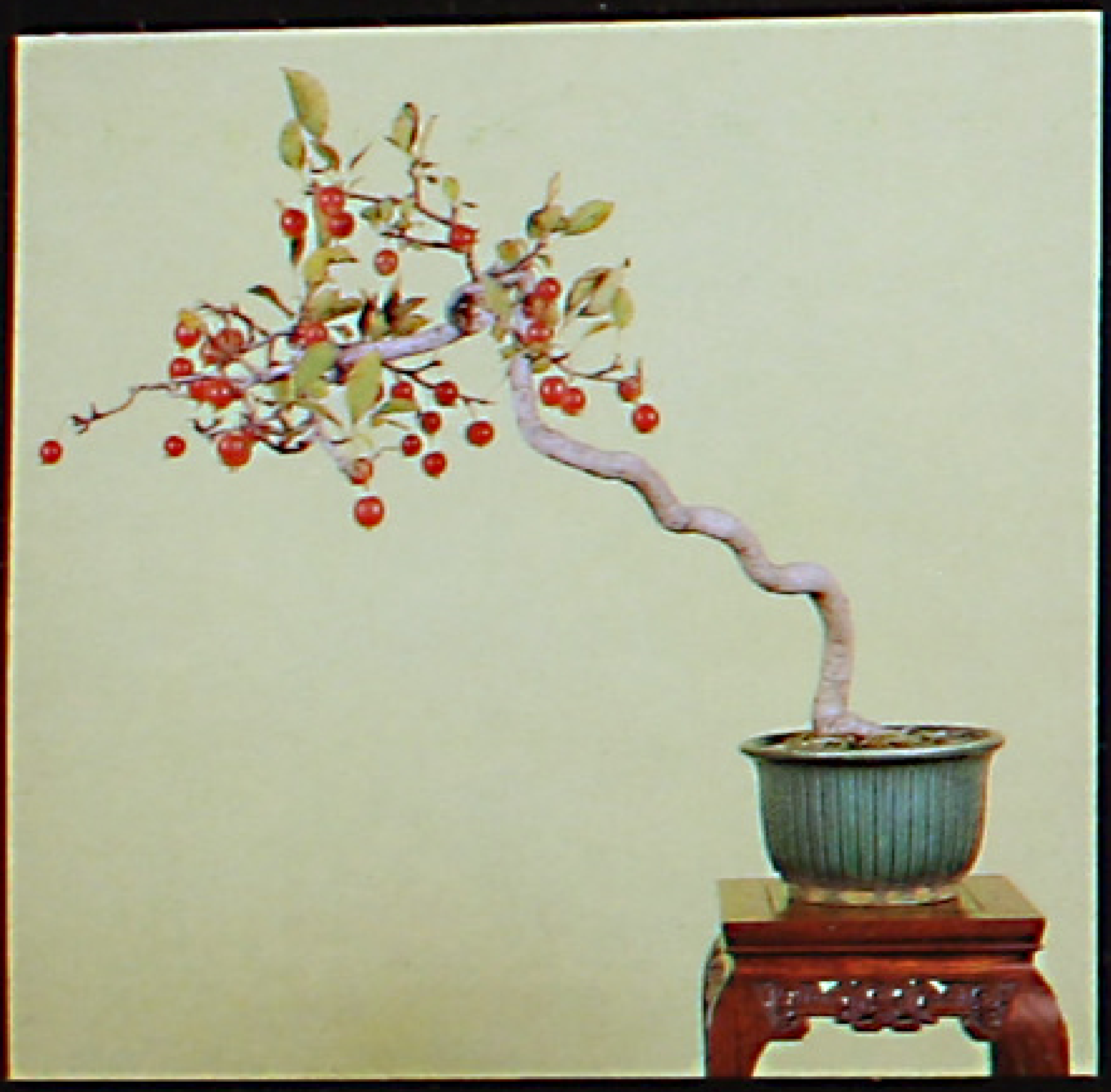
◀ Acer buergeranum.
Height: 15 cm.

▼ Malus Sieboldii.
Height: 68 cm.



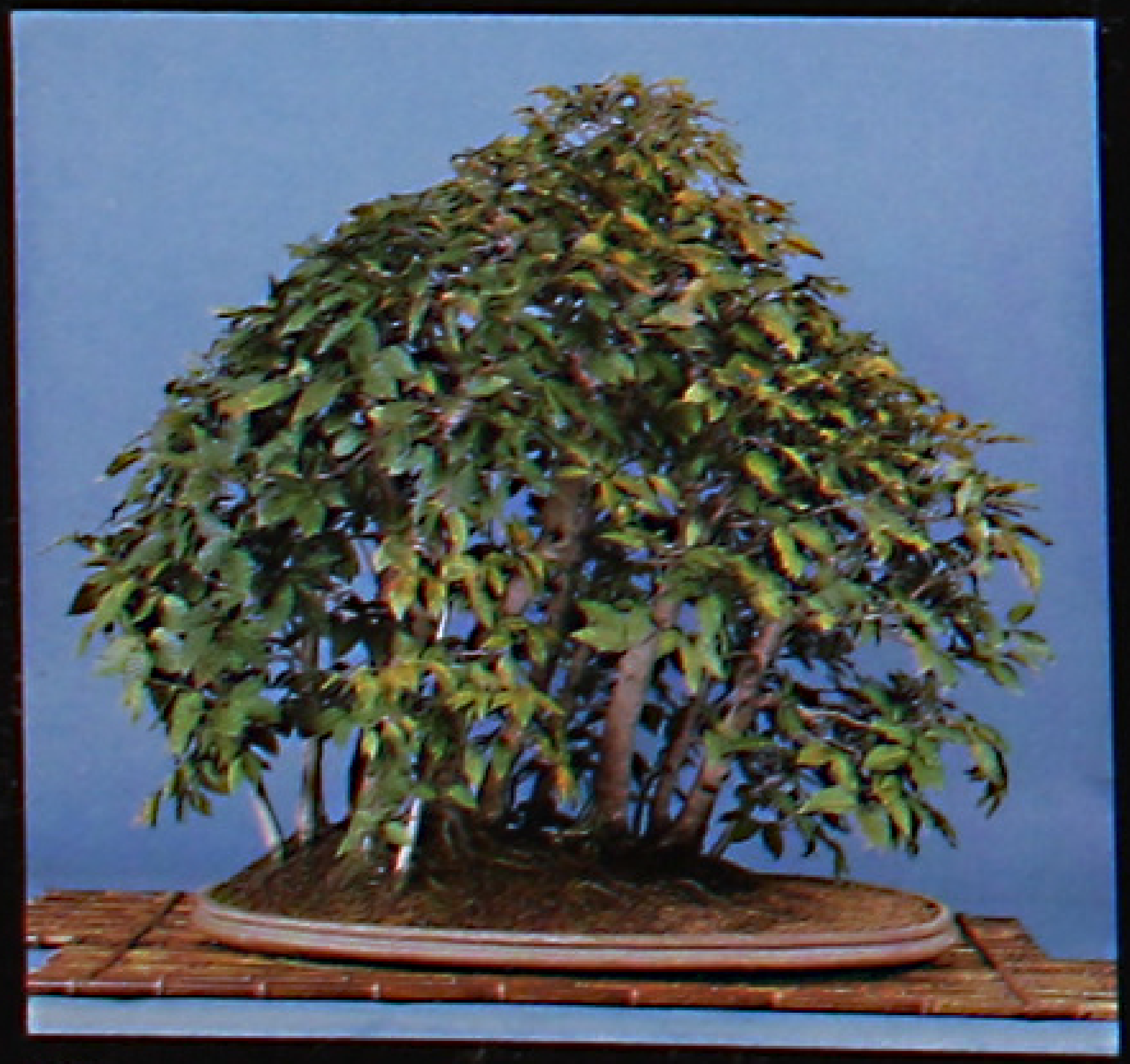


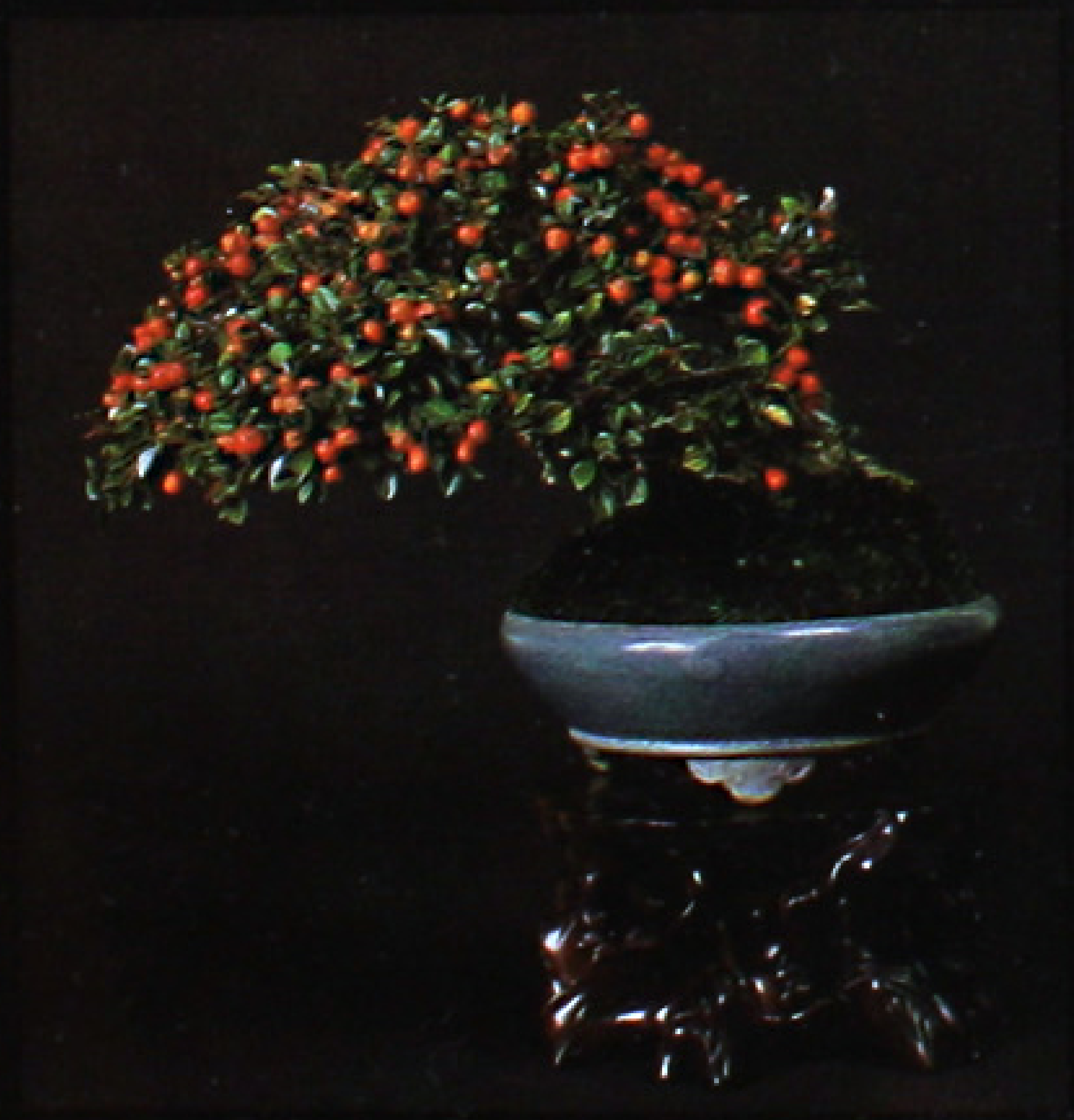
▲ Euonymus oxyphylla.



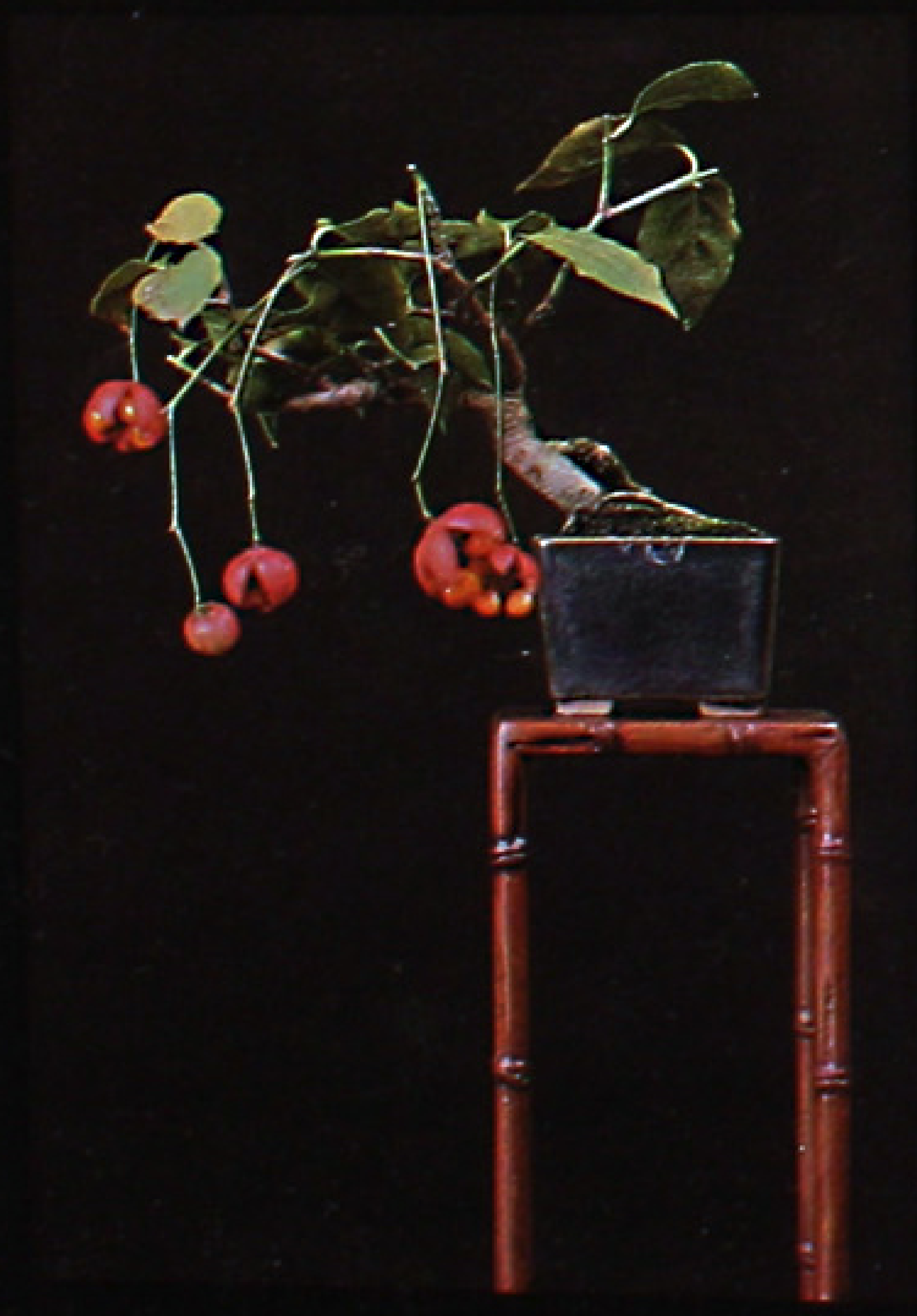
▲ Malus Sieboldii.

▼ Fagus crenata. Height: 93 cm

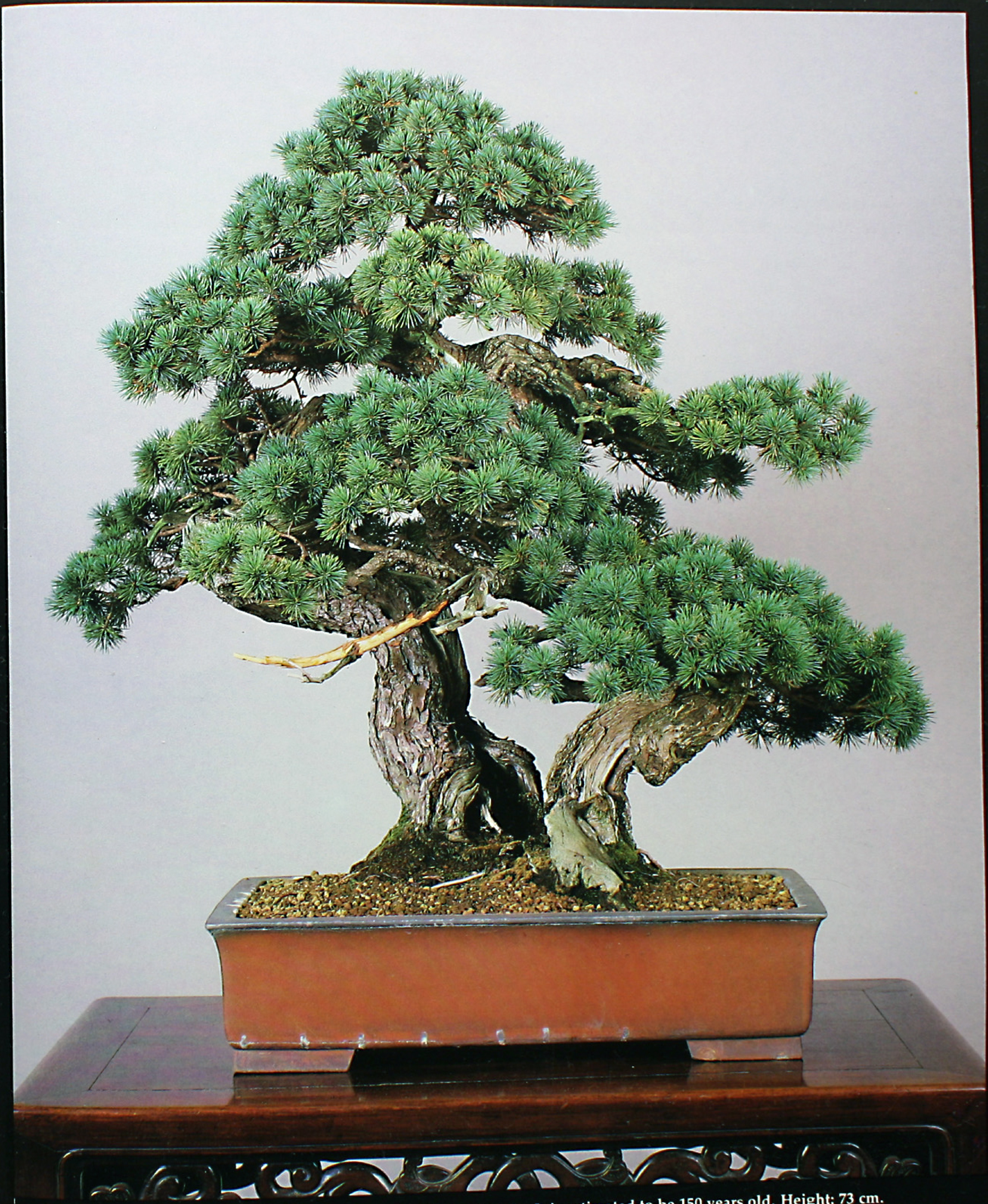




▲ Cotoneaster horizontalis. Height: 21 cm.

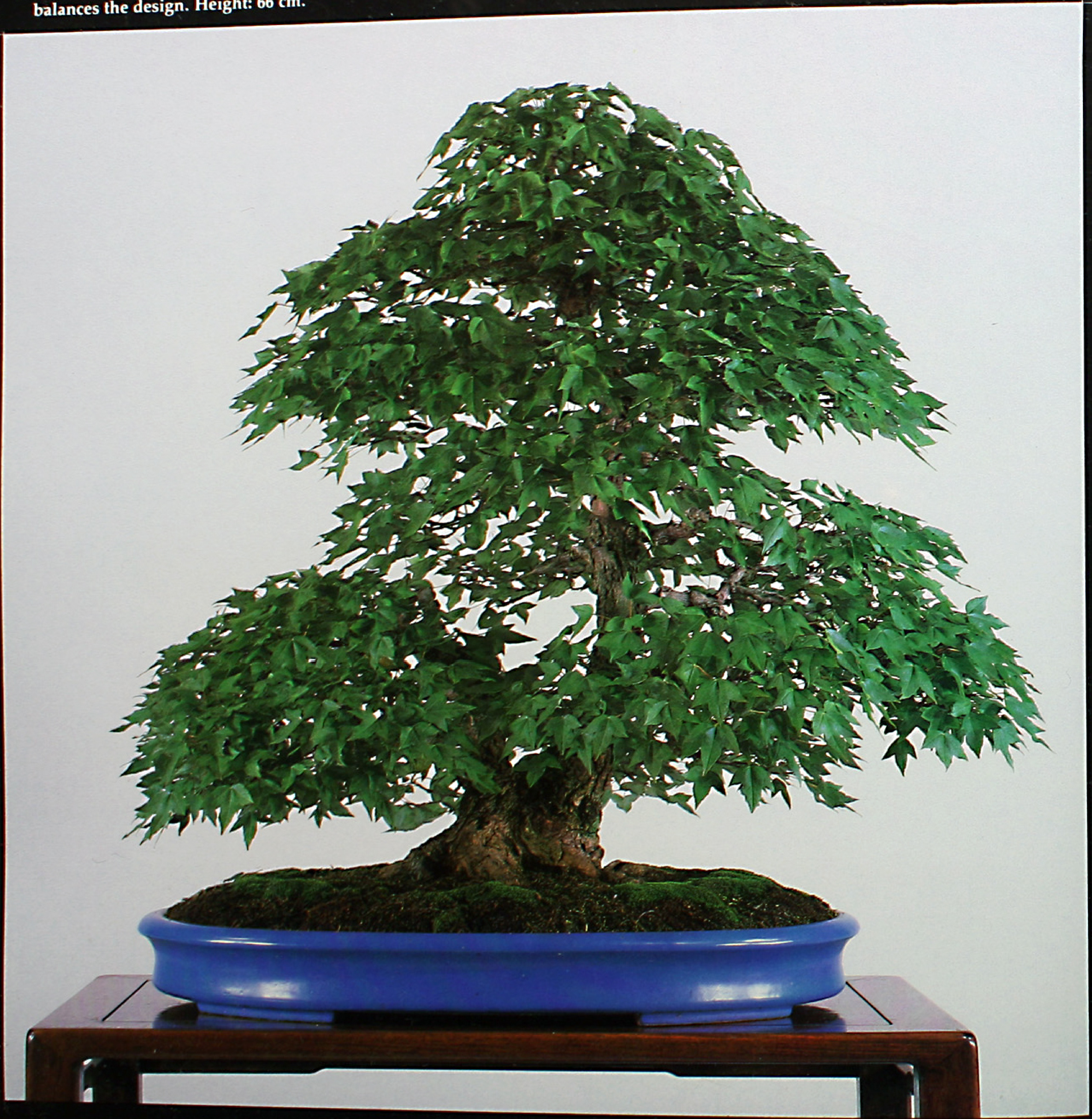


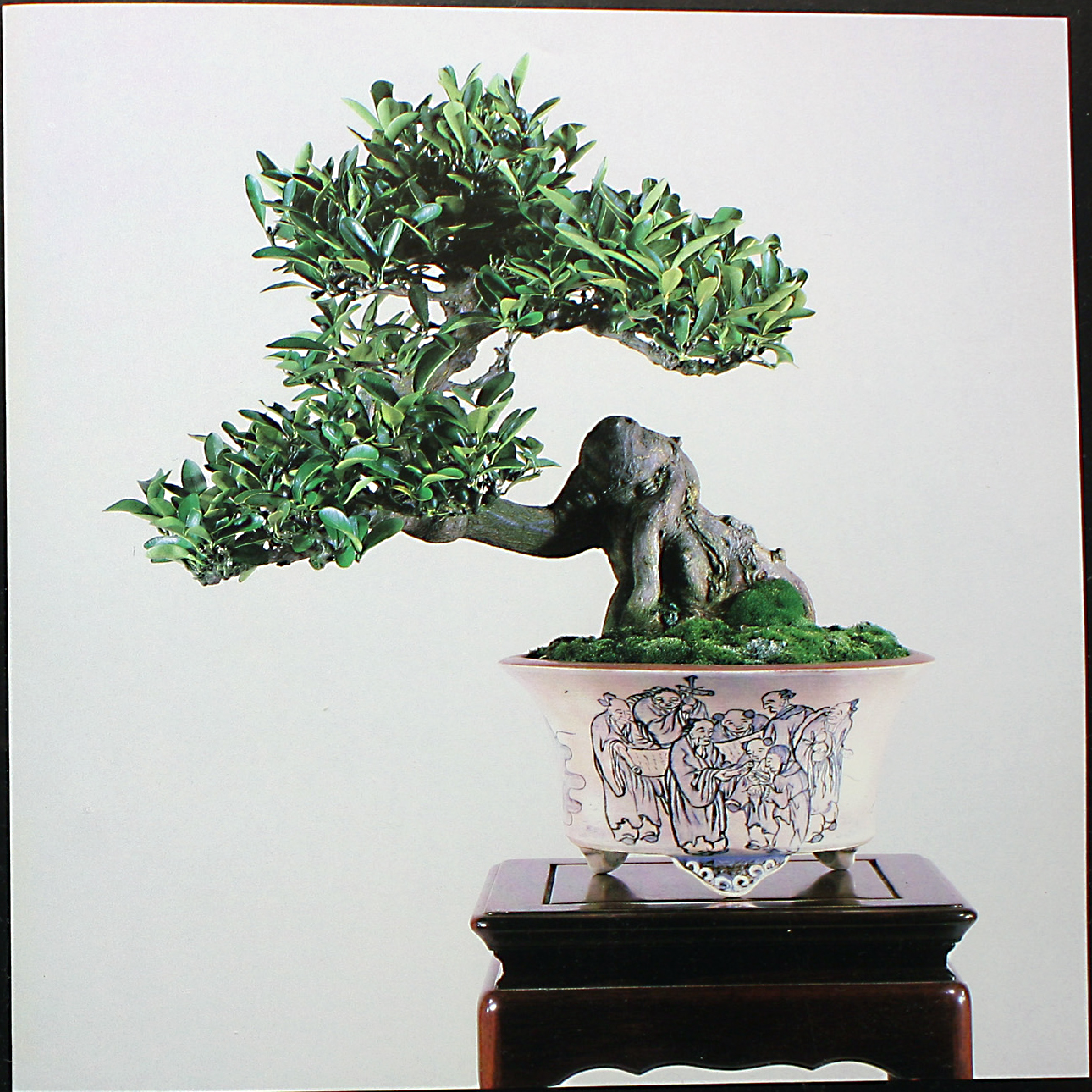
◀ Styrax japonica. Height: 15 cm.



▲ Magnificent example of a Five-needle pine in the twin-trunk style. It is estimated to be 150 years old. Height: 73 cm.

▼ Trident maple (Acer buergeranum) in the twin-trunk style. The foliage mass on the shorter trunk beautifully balances the design. Height: 66 cm.



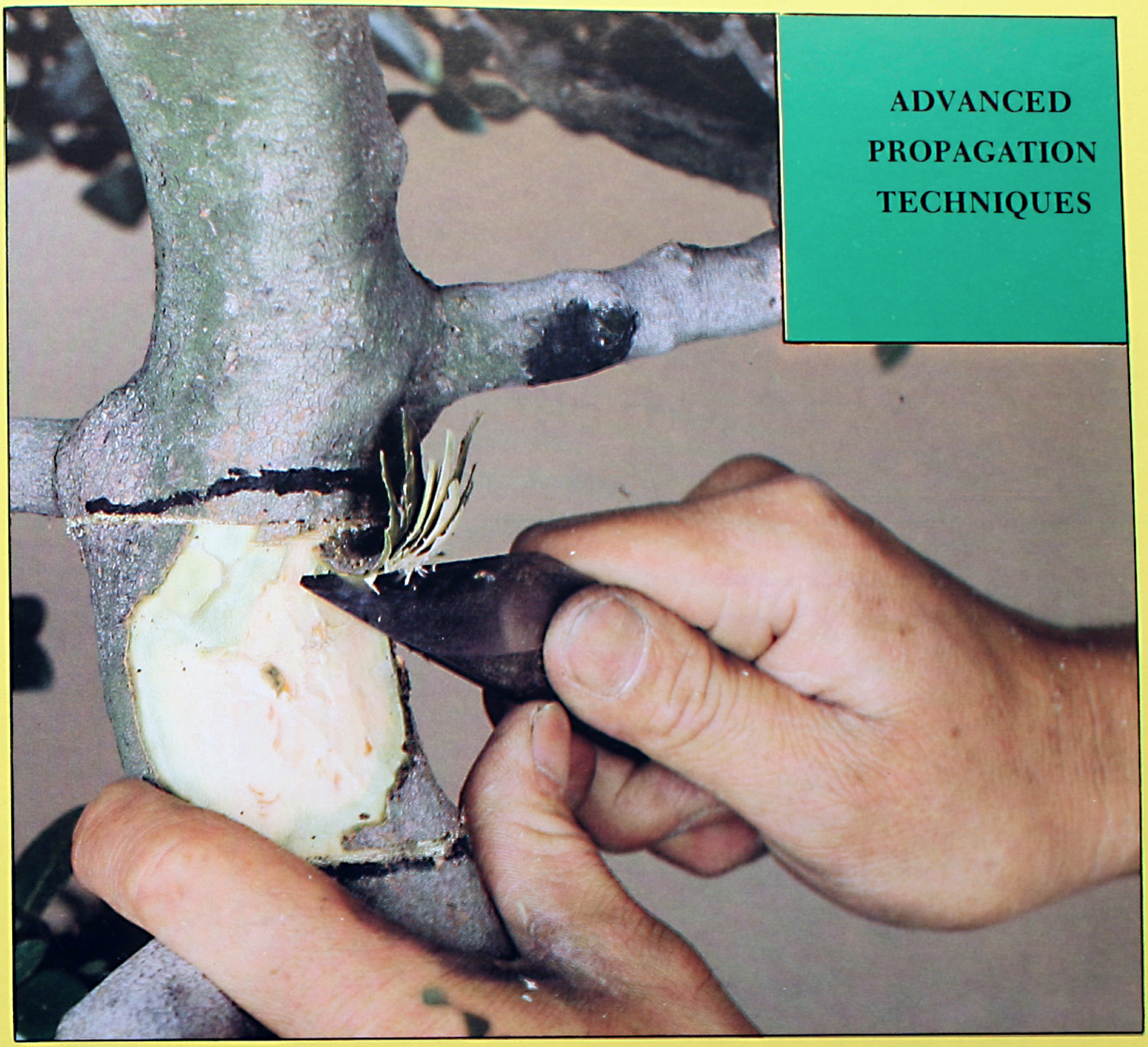


▲ **Fortunella.** This evergreen Chinese shrub, commonly called kumquat, has diminutive orange-like fruit that are nicely in scale when grown as a bonsai. The lower photograph shows the tree in fruit. Height: 28 cm.

Next page.

Tamarix in the twin-trunk style. Height: 70 cm.

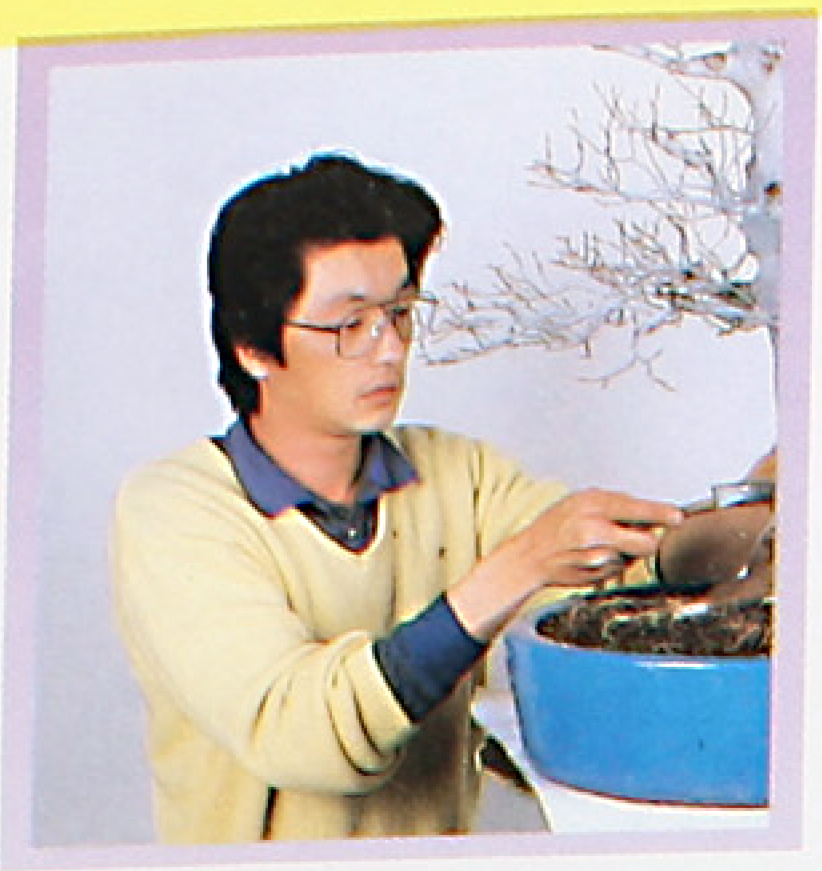
ADVANCED PROPAGATION TECHNIQUES



AIR LAYERING

Authors: Watanabe Sinichi
Watanabe Keigi

Layering is a reproduction technique that is frequently used in Japan for creating bonsai from relatively large trunks or branches. The technique is not frequently used in Western countries, because the layering methods commonly practiced have a tendency to produce serious design faults. Specifically the callus that develops at the layered section and the swelling that accompanies it are often unsightly, and the roots that form are often not well distributed around the trunk. The authors of this article present a new layering method that assures good rootage and a smooth transition from the new roots to the lower part of the trunk. At the same time, the method causes new roots to be produced from the layered trunk or branch section much more rapidly than conventional techniques.

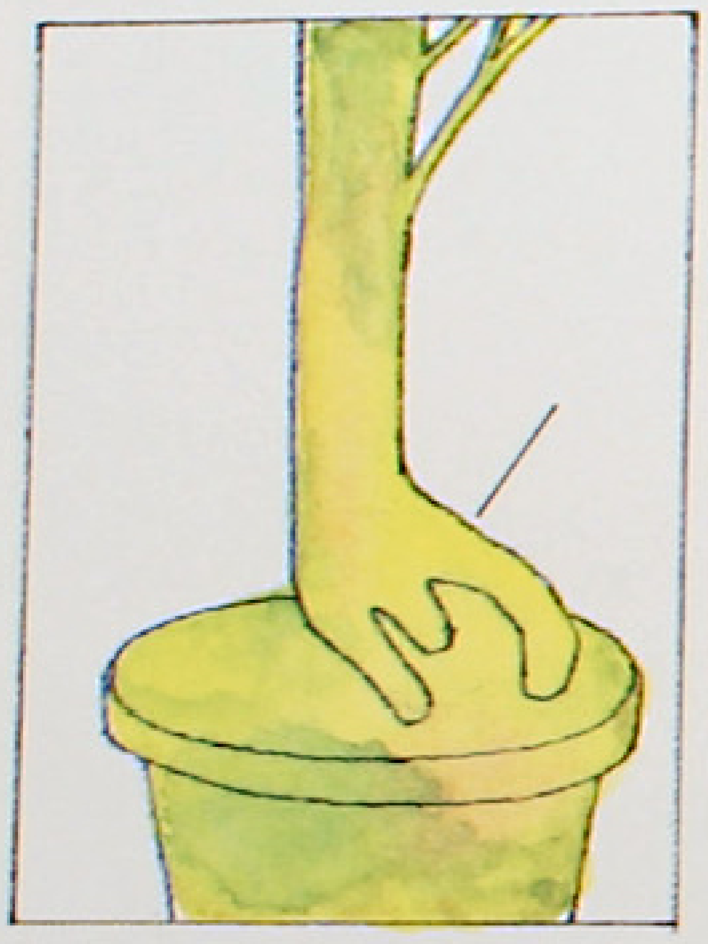


Watanabe Keigi

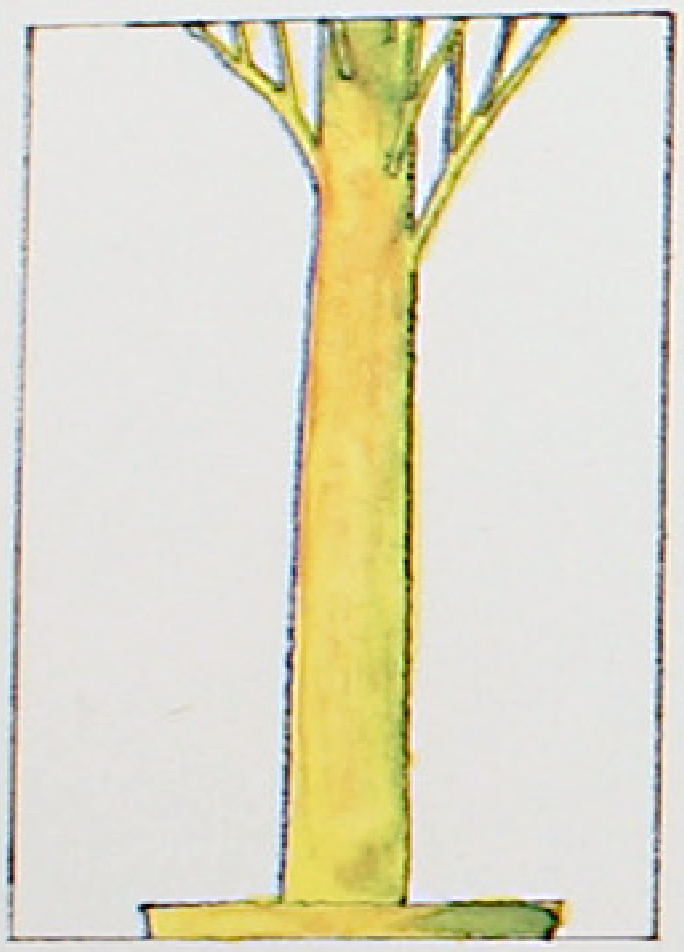
Watanabe Sinichi

Introduction to layering

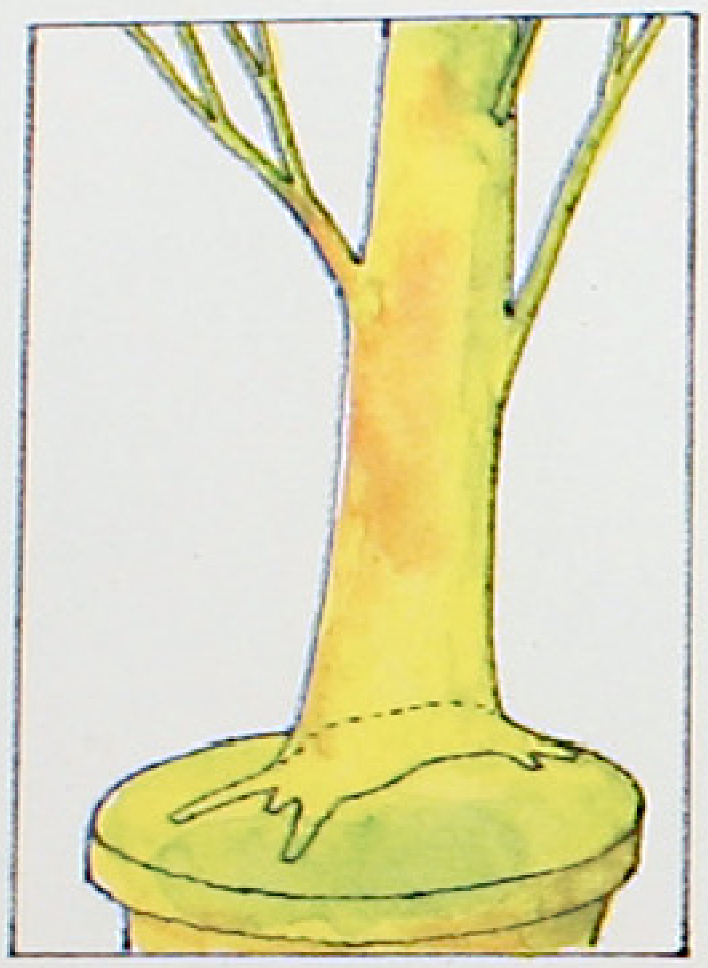
These are the most common defects in trees collected from nature:



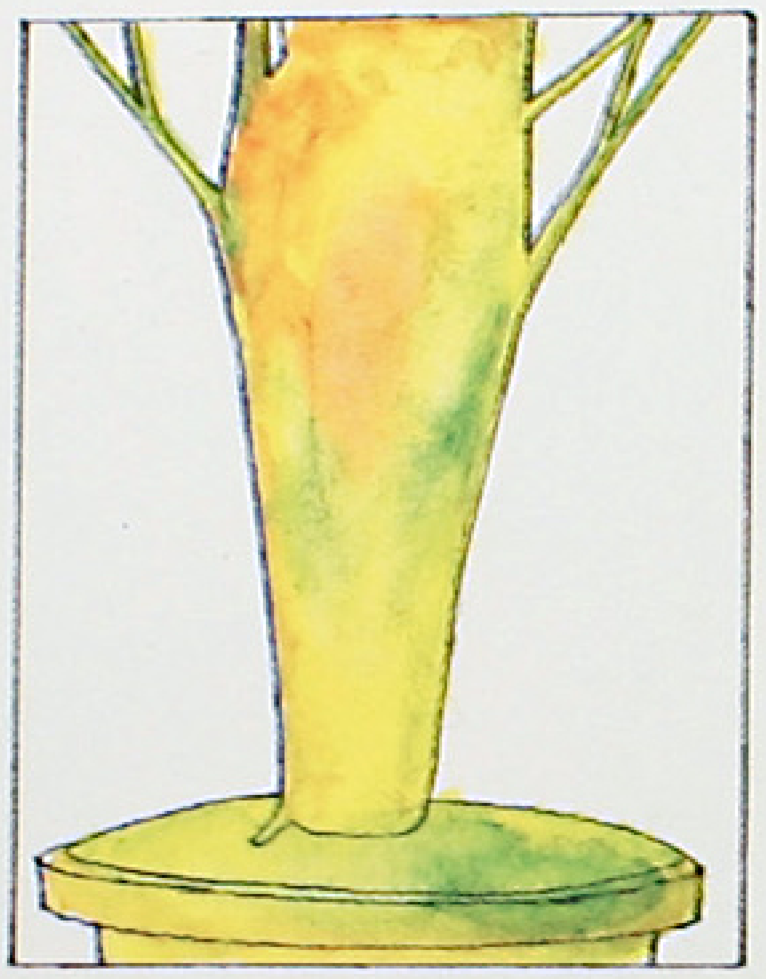
Roots only on one side



Trunk with no taper

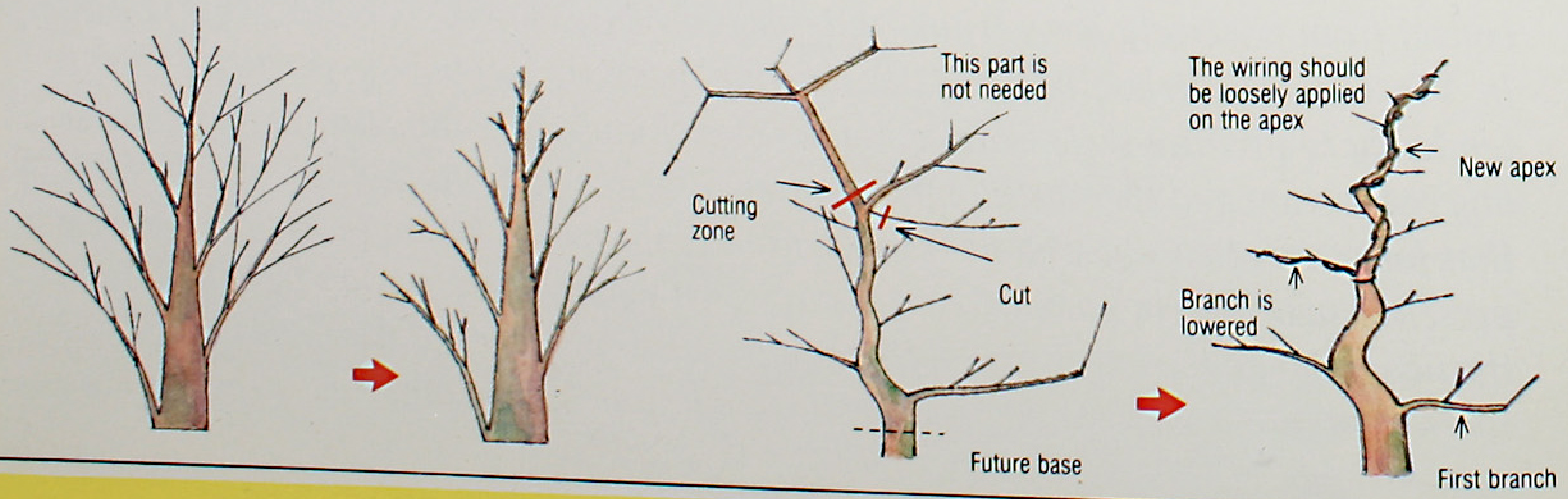


Poor surface roots

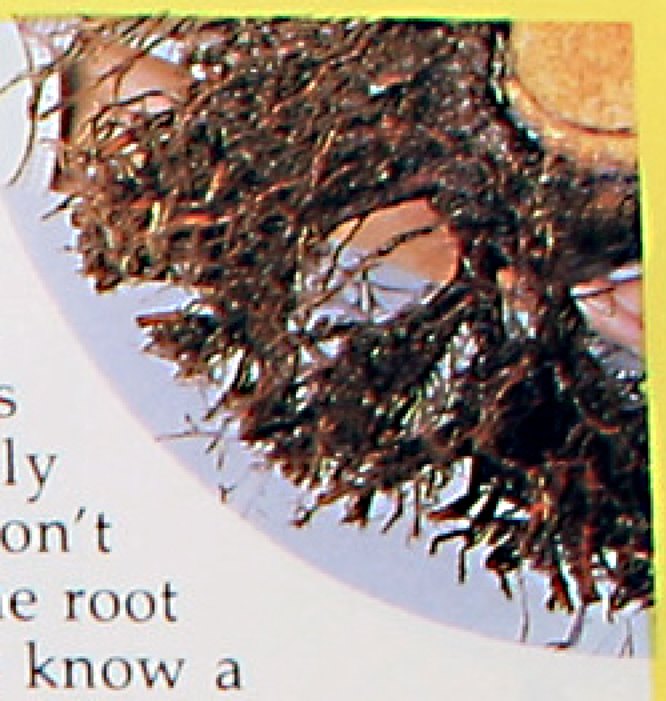


Trunk with reverse taper

Once the tree has been taken from the wild, those branches that do not contribute to the final design may be cut off, but always proceed slowly with recently collected trees because at first they are especially weak and must adjust to the new environment. So, if a thick branch needs to be removed, it is better to wait until the tree is fully rooted and well established. In the case of cutting thinner branches, sealing paste should be applied to all cuts. Those parts of the tree that need wiring can be wired right away, as long as the wired branch does not have to be bent or twisted very sharply.



TECHNIQUES OF PROPAGATION: AIR LAYERING



Layering is based on the ability of most arboreal species to produce roots from areas of their trunk or branches that have been buried. In Bonsai one of the variations of layering often used is called air layering. In this technique, a rooting medium is brought into contact with the area of the trunk where we are interested in producing roots. Because roots can be produced anywhere on the trunk, this technique permits great design flexibility.

This method was first described 60 years ago in a book by the author and famous Japanese Bonsai master, Kyuzo Murata.

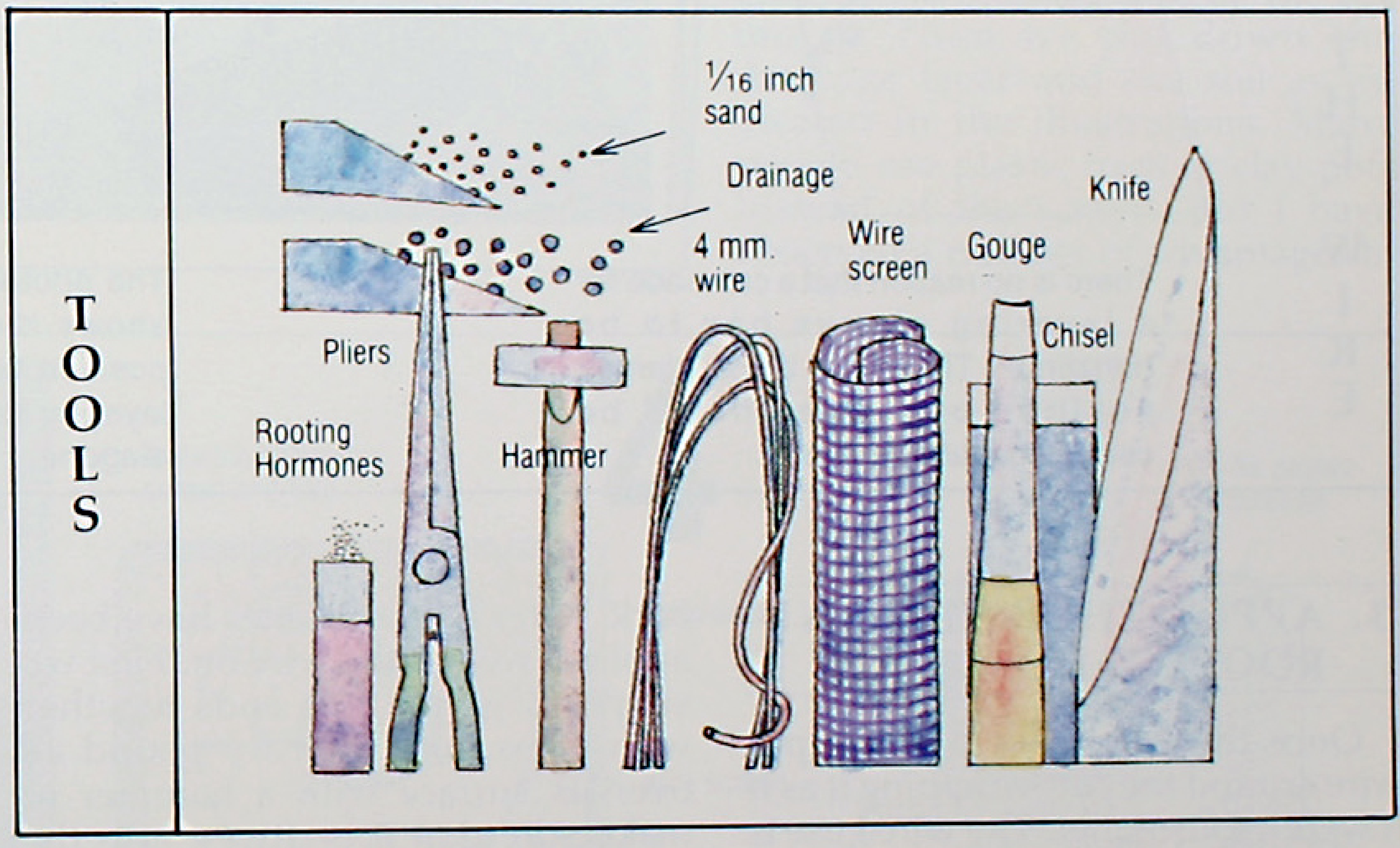
Mr. Murata used it on the Japanese fir, the five-needle pine, and the beech. His method consisted of wrapping wire below the desired rooting area and covering it with long-fiber sphagnum moss. In more recent years, the moss was wrapped in plastic to retain moisture. Some time later, depending on the rapidity of the tree's growth, the wire would cut into the bark, thus stimulating new roots in the desired area. The main inconvenience with this method was the time needed for the roots to appear, which varied between two and seven years. In addition, a callus or enlargement in the upper area of the roots formed, which was not aesthetically pleasing and had to be hidden in some way.

Later, other methods were developed, the most commonly used being the following: in the area immediately below where roots were desired, a ring of bark was peeled off about one half inch or so wide, depending on the thickness of the section to be layered; rooting hormones were applied, and the area wrapped in sphagnum moss and plastic as in the previous method. But this procedure also has the drawback of not producing a natural thickening at the area of root formation, and so Bonsai obtained through this method tend not to have a good surface rootage, or *nebari*.

My nursery is located in an area of Japan where there are many beeches, and my collection is almost totally composed of collected trees. As collected, many of them had some defect in the roots or in the base of the trunk, and so layering was frequently done to obtain good Bonsai. However, people who came to Hakone (the name of my nursery) were not pleased with the results. The beeches only produced a small number of roots, which usually grew downwards; only on rare occasions did I obtain a good specimen. Therefore, I began to try different methods and techniques until achieving, some eight years ago, what I was aiming for: good *nebari* [surface rootage] and *tachiagari* [line and taper of the lower part of the trunk from the base to the lowest branch], and, in addition, results were produced in a very short time.

The process, in general terms, is quite different from previous practice. It combines some of them, and with a very important change: the season in which I do the layering.

Previously, layering had been done in June (in Japan) or in any season in which the tree is halfway into its budding, that is, spring to very early summer. In my method, layering is done in January-February, that is, when the tree is completely dormant. This is a tremendously important change, because until now it was postulated that if we layered when the trees had not yet begun to bud, a callus would be formed before the trunk sent out roots. But in about 300 trees layered by this method so far, this has never occurred, and among the trees tested there have been very thick trunks, twin trunks, and even little multiple trunks.



Towards the end of autumn, the season begins when my son and I collect from the beech groves that surround our nursery. One can find an almost infinite variety of material, so we concentrate our search for trees which have branches that are nicely located. We don't worry about the root base, since we know a good surface surface root structure can be achieved by layering. After being collected, the tree is planted in a very large pot (I am not partial to planting in the ground, because budding in the spring is much too vigorous — almost uncontrollable). Then it is rough pruned, and the branches that need it wired. The tree first needs to recover, so it will not be layered until the next year, but only if it has budded sufficiently and is healthy and strong.

1. THE CUT IS MADE

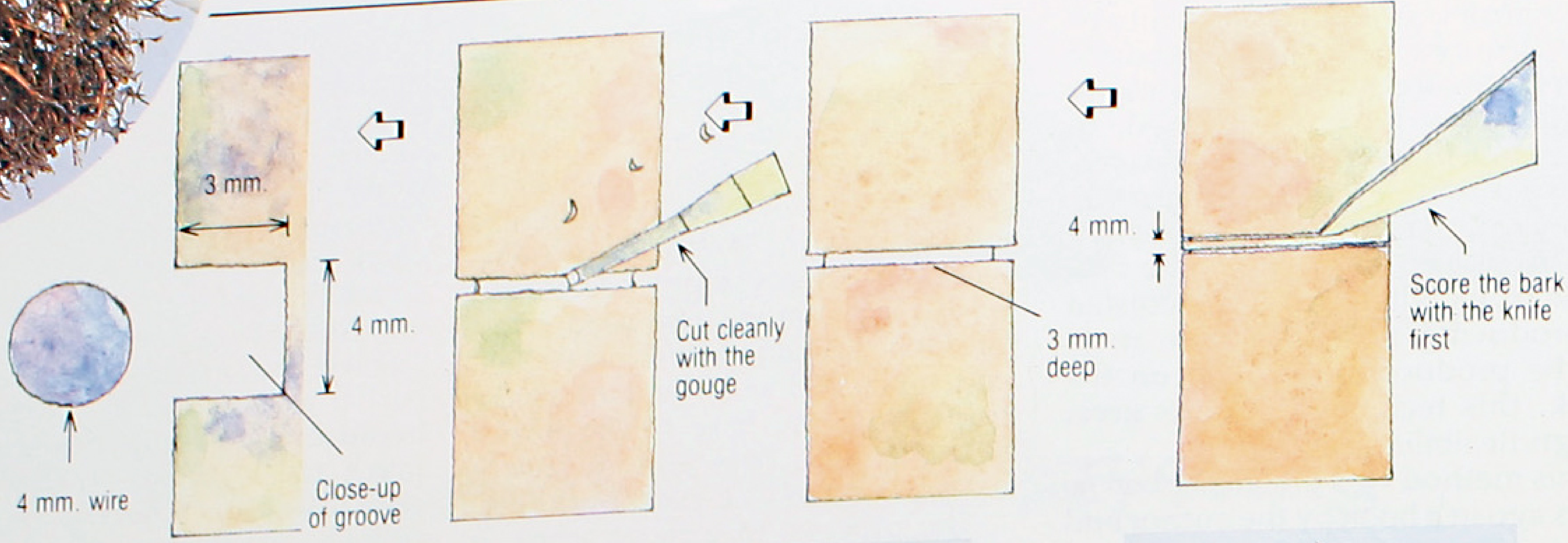
A groove is cut all around the trunk as shown in figure 1.

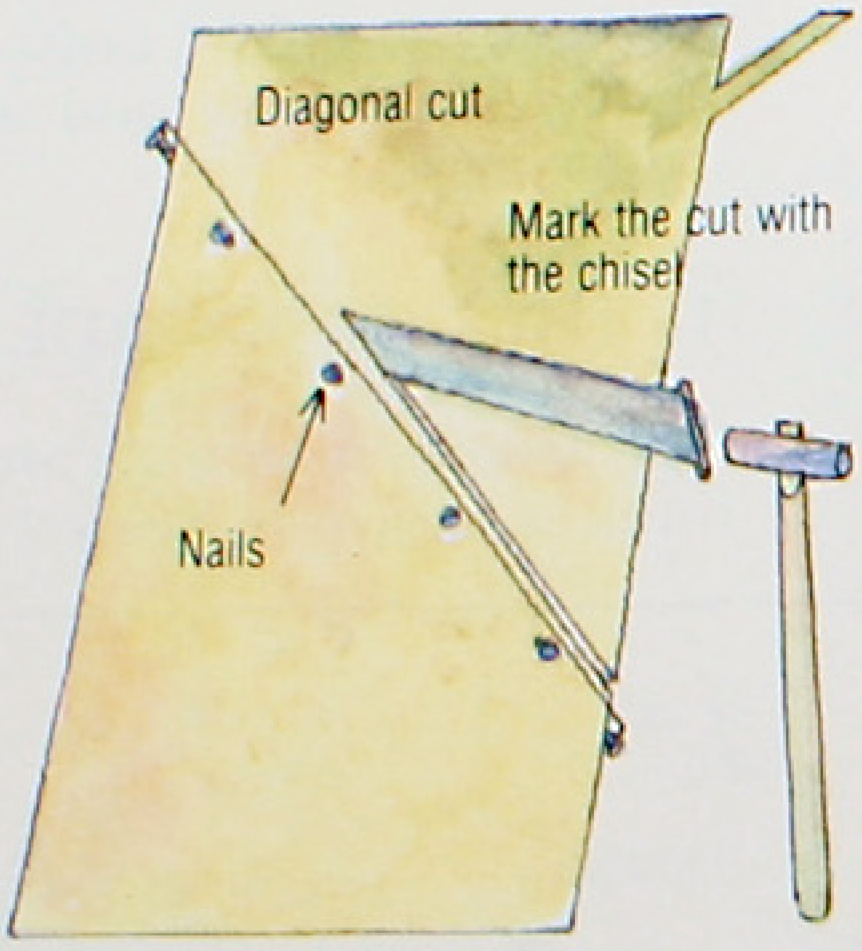
2. THE CUT IS THEN ALLOWED TO DRY

In January and February, the tree does not absorb water through its roots, but within the trunk it has a certain amount of sap, which must be allowed to dry. If this is not done, this sap will tend to heal the wound, which would result in a callus that would not be aesthetically pleasing. To allow the cut to dry, we locate the tree in a place protected from the rain and the night dew, but we never expose it to the sun, since this would weaken it excessively. The period is variable, but generally one or two days is enough.

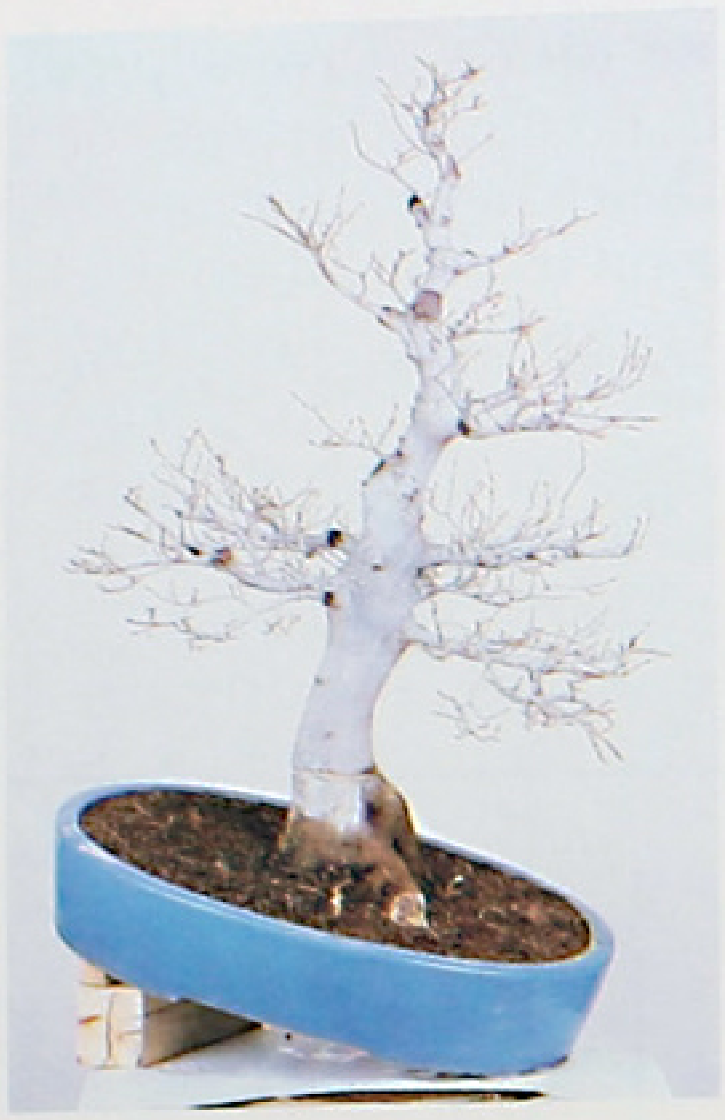
1

HOW TO APPLY THE WIRE


3 mm.
4 mm.
4 mm. wire
Close-up of groove
Cut cleanly with the gouge
4 mm.
3 mm. deep
Score the bark with the knife first



There is no reason that a cut made for a layering always has to be horizontal. Therefore, if the planted position of a tree should be corrected, cut diagonally.

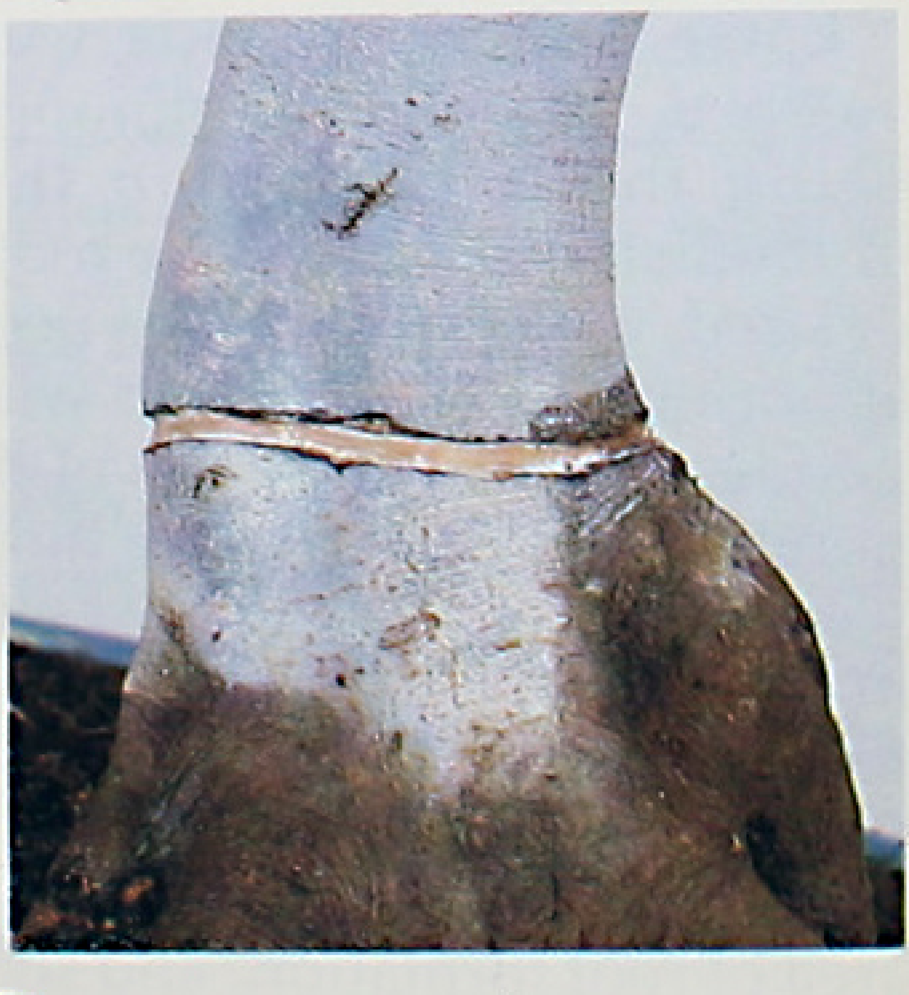


The photograph on the left shows the future planted position of the tree; so the layering will be done on a diagonal.

3. APPLY THE WIRE AND ROOTING HORMONE

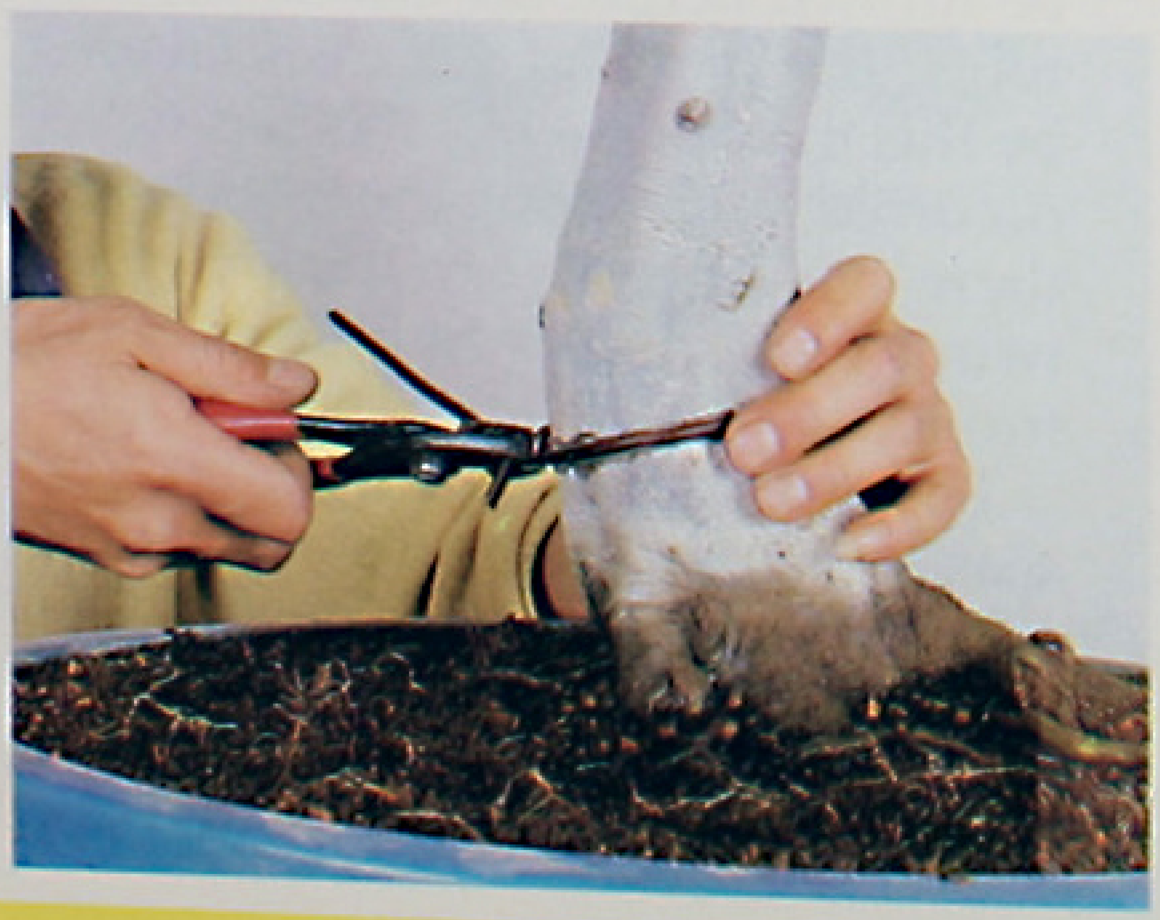
Once the incision is dry, we put wire around the cut, wrapping it as if it were a tourniquet. The wire I use is aluminum and I do not advise using steel or copper wire, because they produce oxides which may be toxic to the roots and trunk.

Rooting hormones are found commercially in liquid or powder form. Personally, I recommend the powder form, since it is safer and easier to apply: we simply take a brush and spread a certain amount of the powder on the incision before putting the wire on. The hormones don't really force rooting to take place, but they do favor or stimulate it. Care should be taken when using the hormones in liquid form, since essentially they are composed of acid (either indoleacetic or indolebutyric), and an excess could burn the bark. After the hormones have been applied, we put the wire on. First we simply twist the two ends together with pliers, and then we pound all over its surface with a hammer to make sure that it is driven into the trunk around the whole perimeter. If you look at the color diagrams, you will see that the depth of the cut is about three quarters of the wire diameter. You need to pound the wire until, when you pass your finger

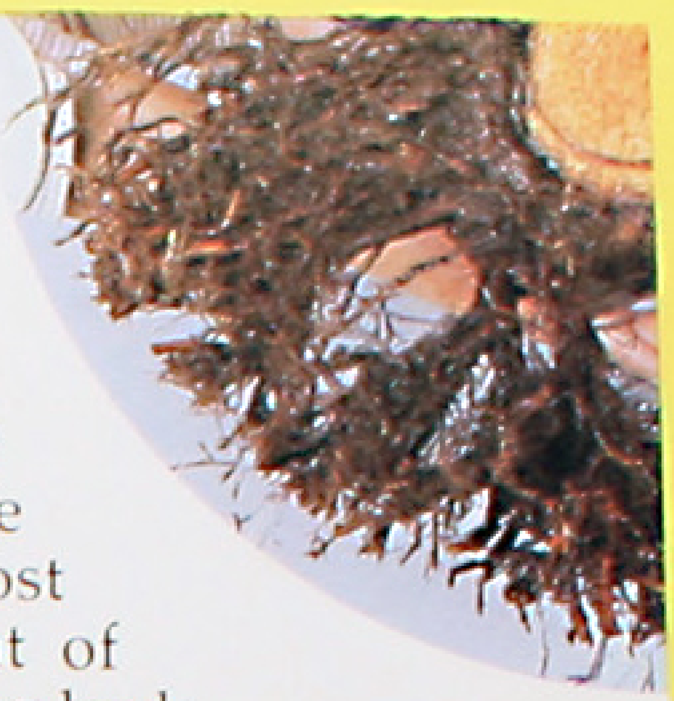


2

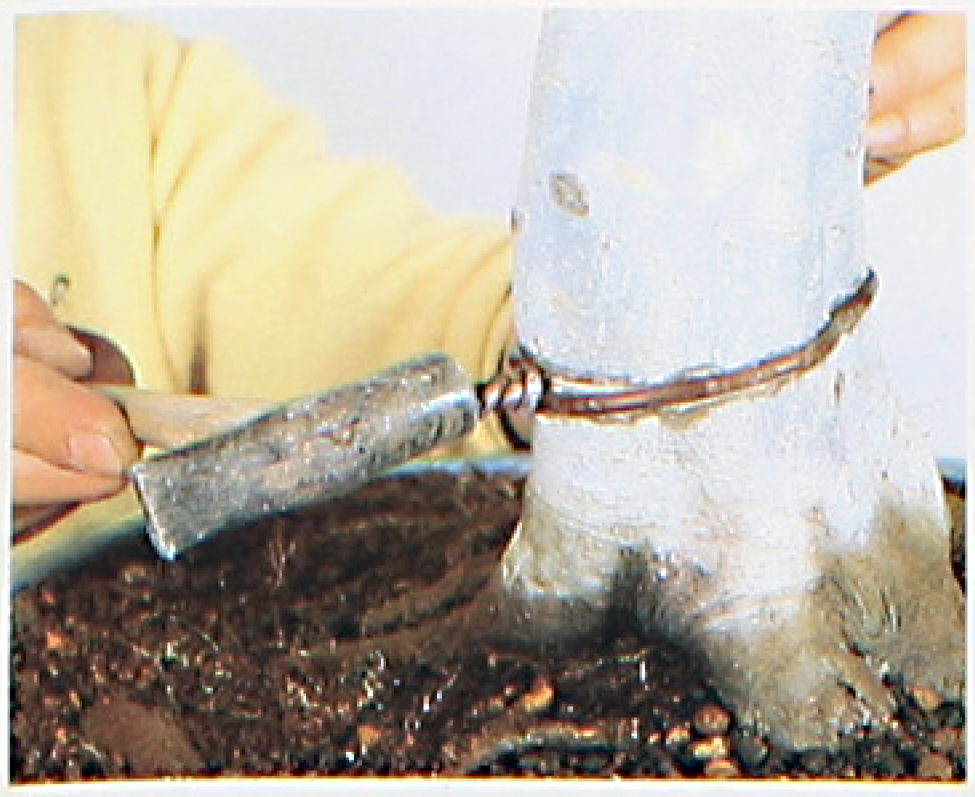
The cut should be allowed to dry



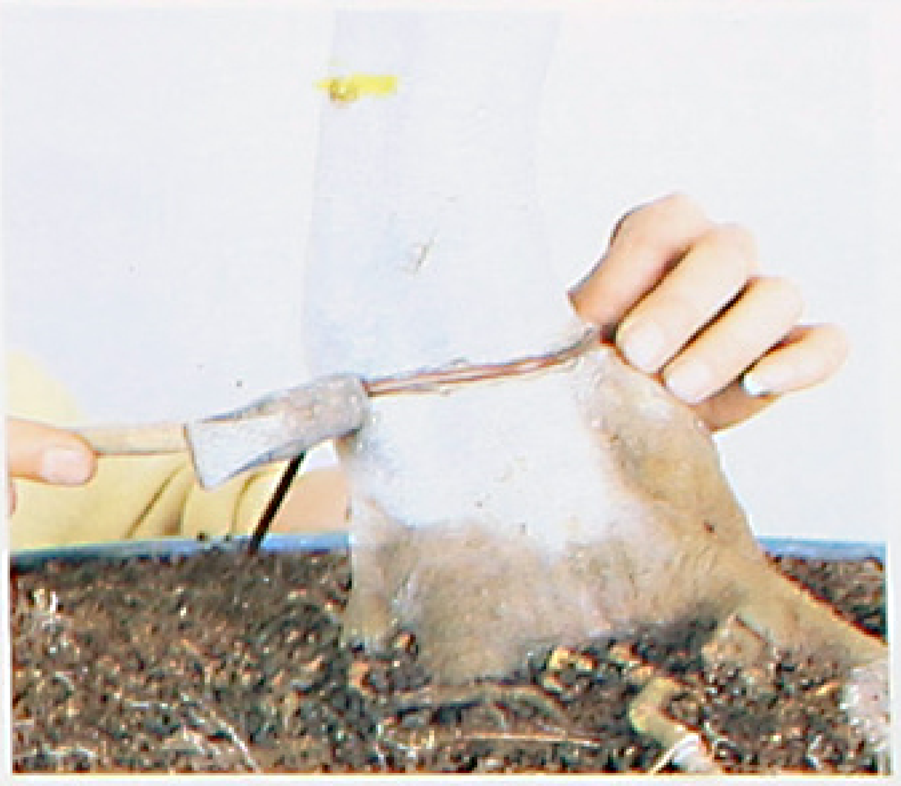
◀ Then wrap the wire around the tree tightening it with pliers.



3

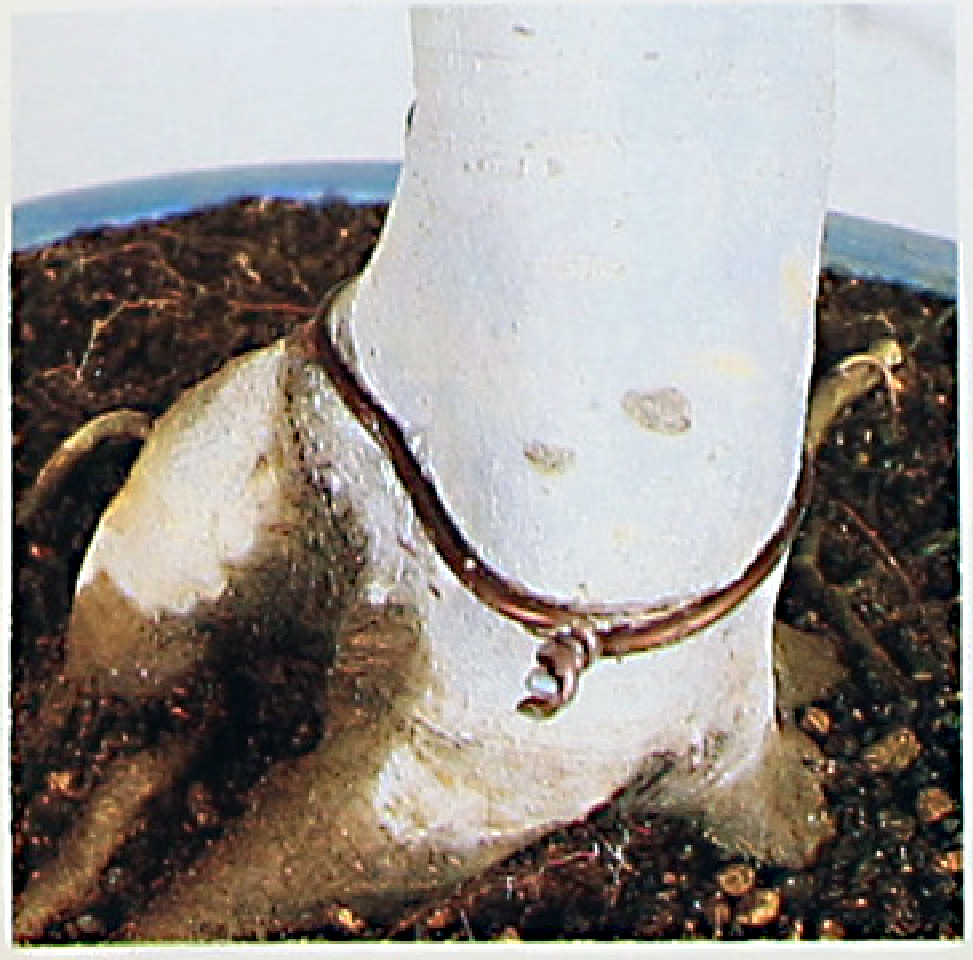


▲ Pound the wire with a hammer...

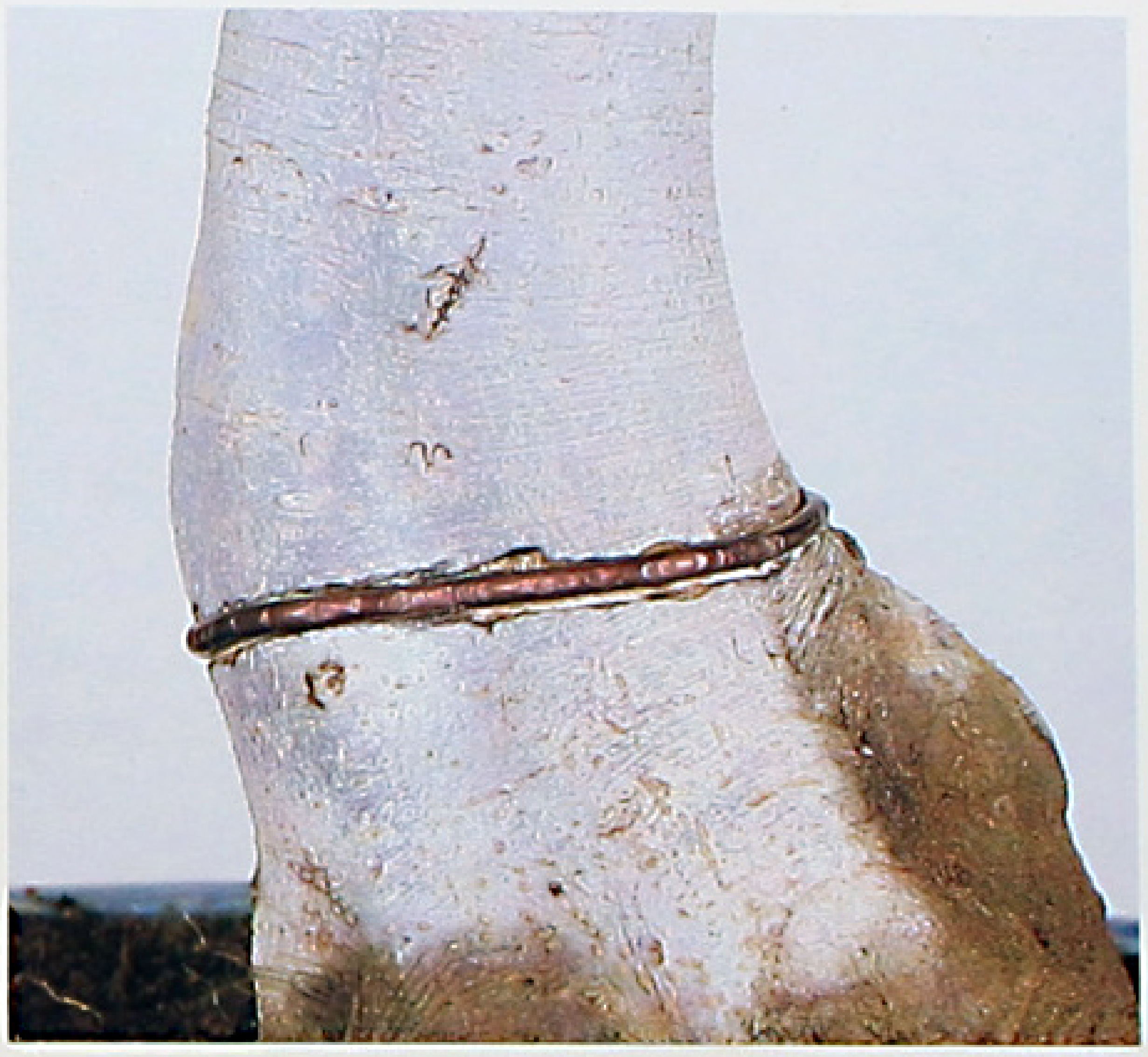


▲ ... until it is deeply within the groove.

▼ In this way, it follows the shape of the trunk.



▼ The wire should be fit very snugly all around the trunk.

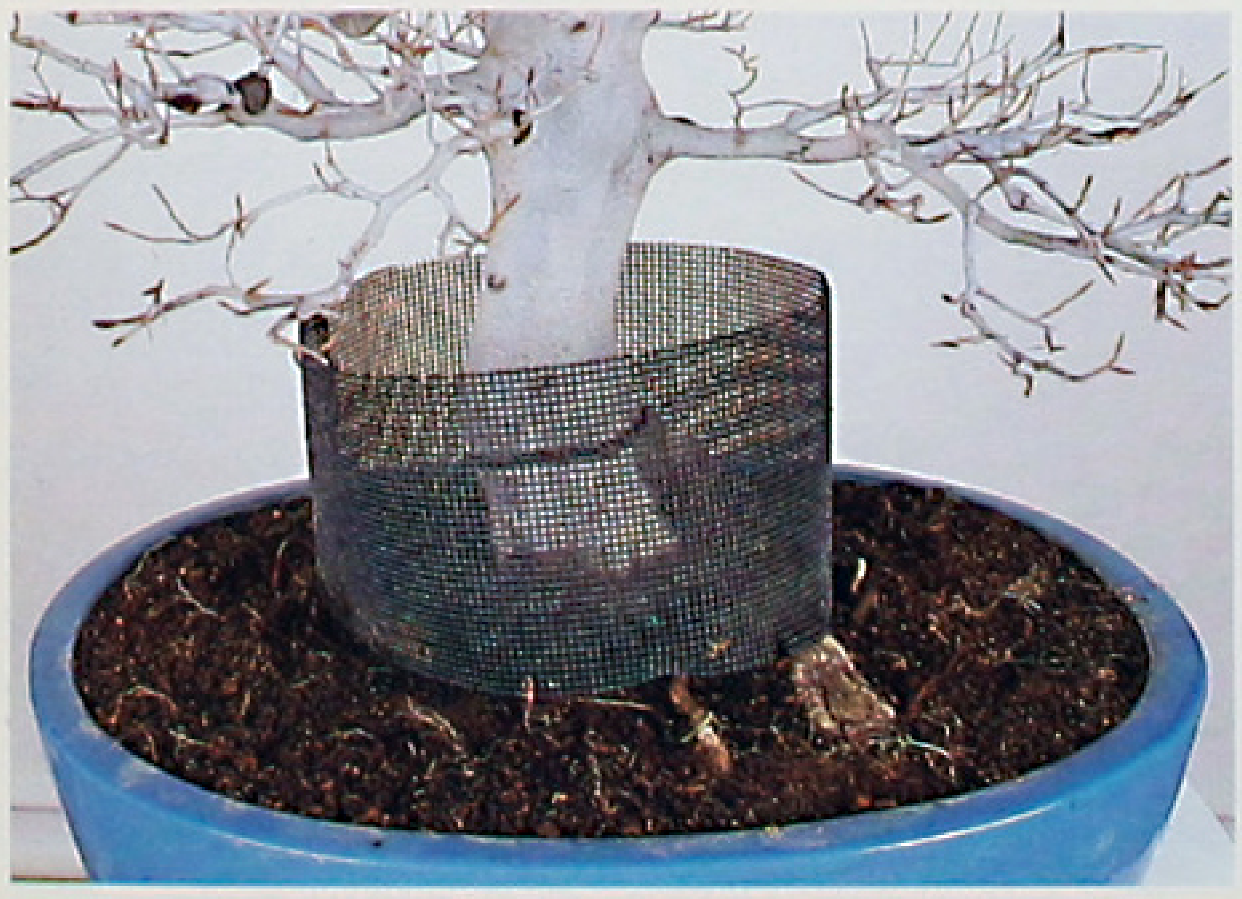


over it, the surface of the wire feels almost level with that of the surrounding bark.

4. PUT THE WIRE SCREEN AND SOIL IN PLACE

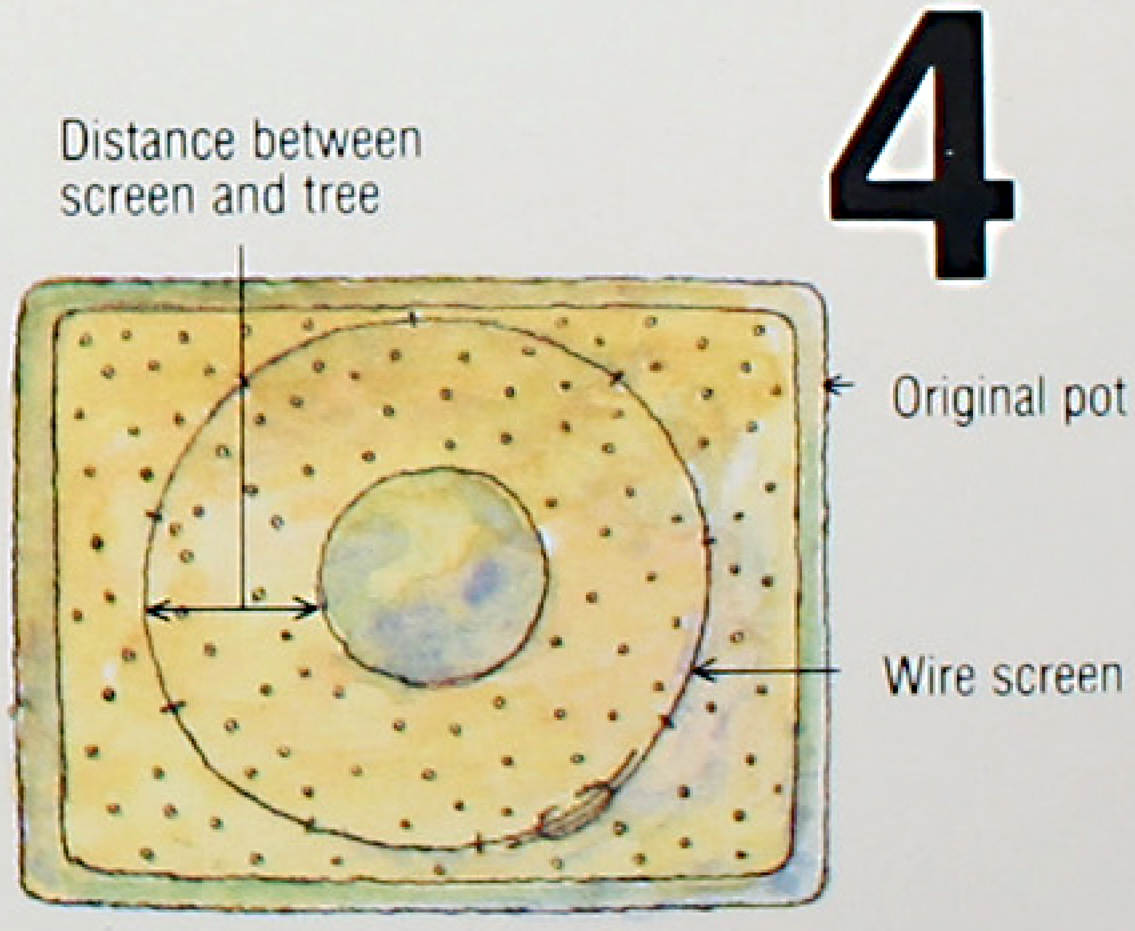
Once the wire is in place, we should provide soil so that the new roots will have a place to grow. The soil also serves to keep the area of the cut moist.

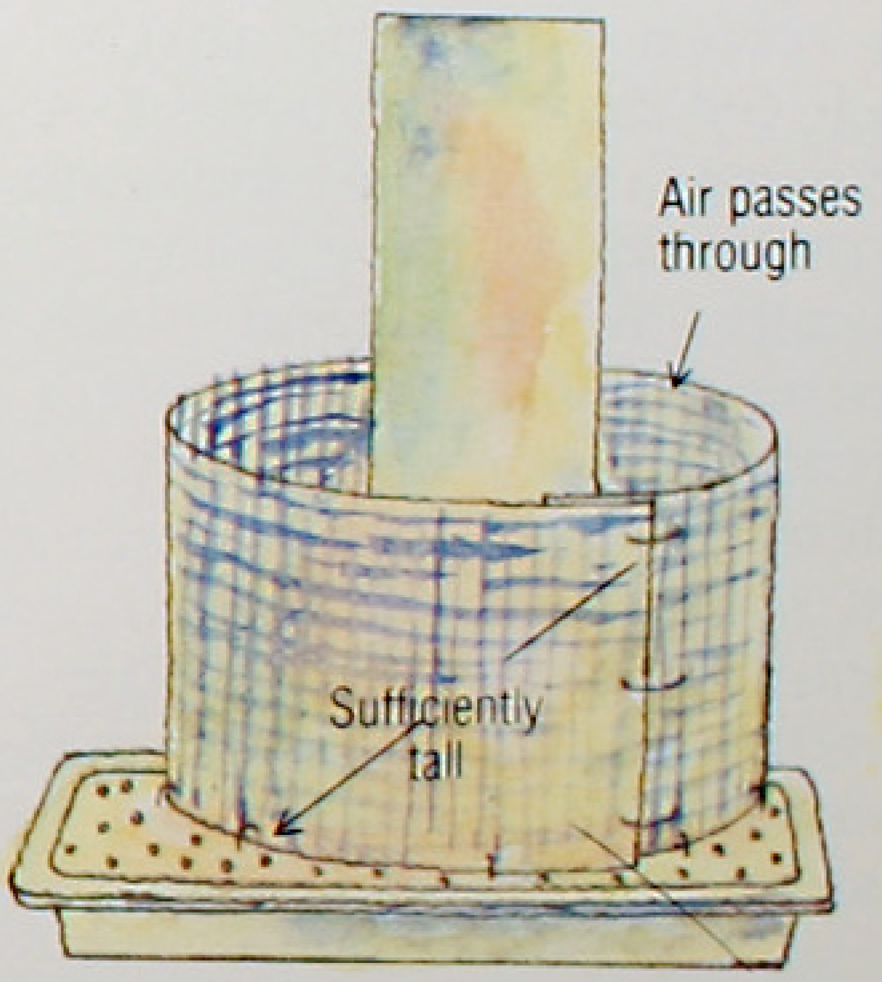
To retain the soil, we put into place a wire screen sufficiently tall to cover the cut, extending an inch or so above it. Its diameter should be two times that of the trunk, so that the new roots will have enough soil. Once the screen is in position, and before putting in the soil, we apply wet, long-fibered sphagnum moss around the incision to keep the cut moist. Then we put down the drainage layer and the soil as indicated in the illustrations. Many people use plastic bags or clay pots instead of the screen, but I have observed a number of advantages to



▲ Position the screen as shown.

4

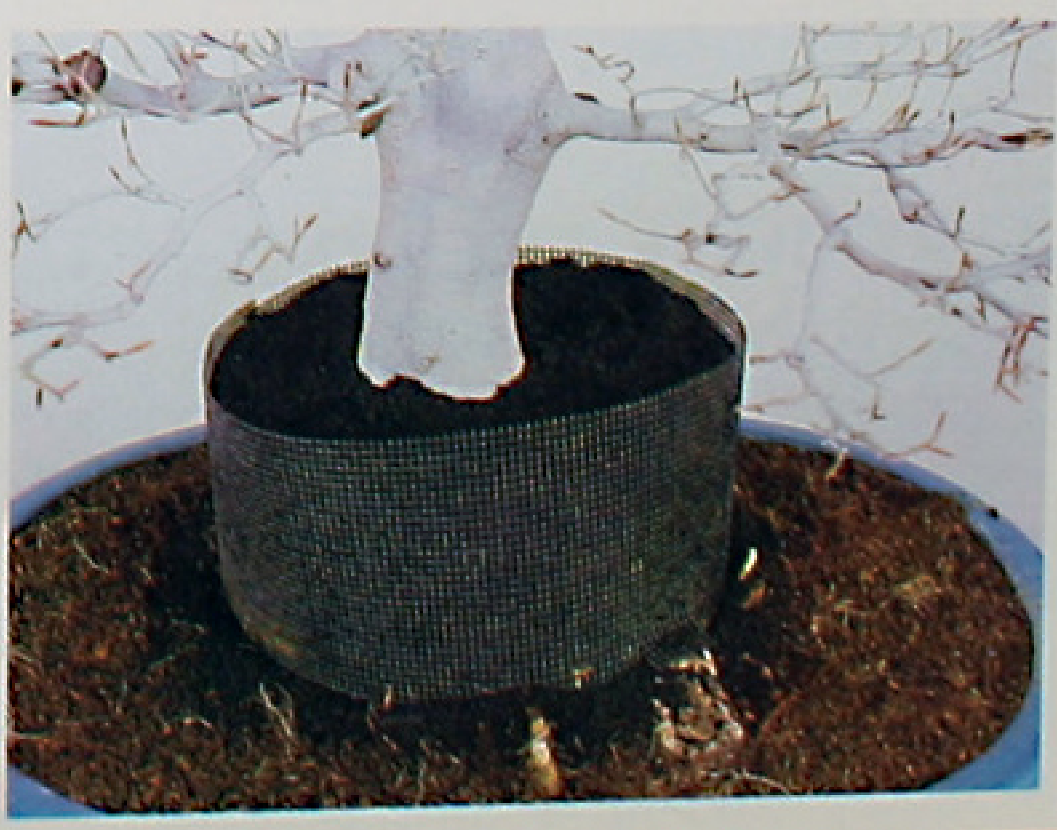


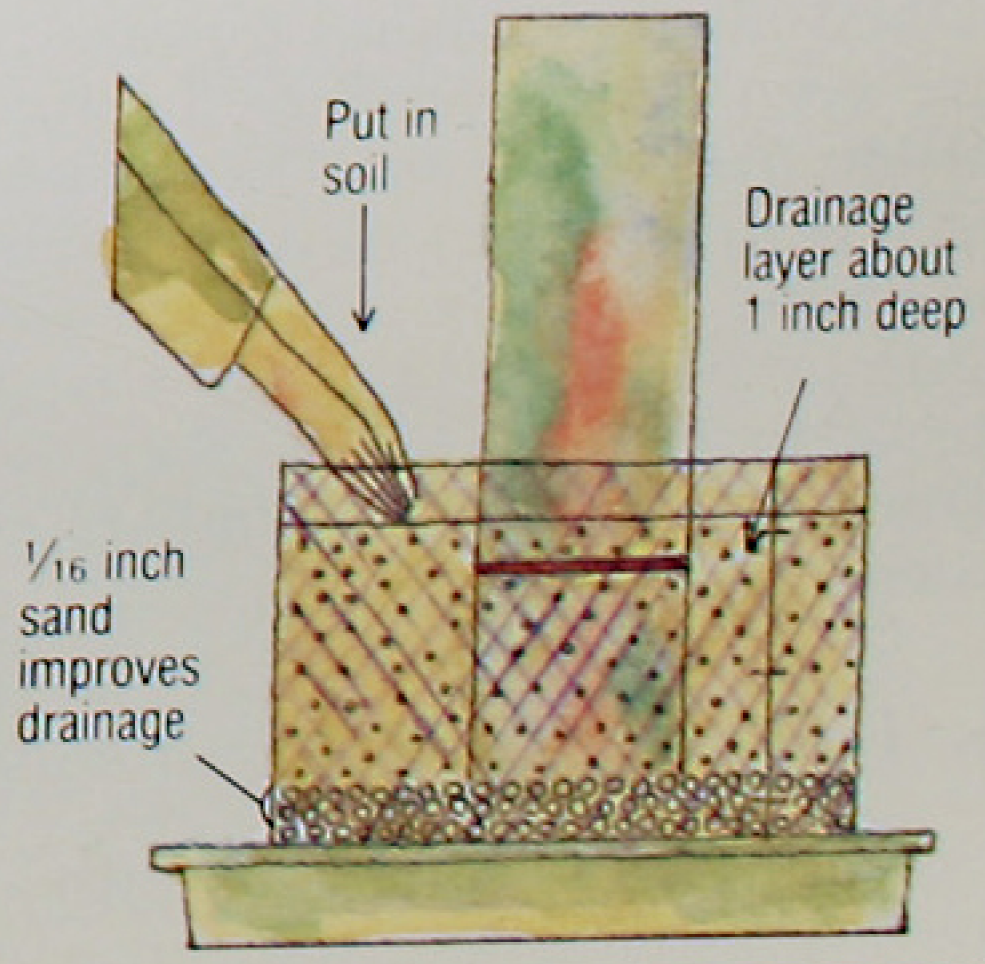


5

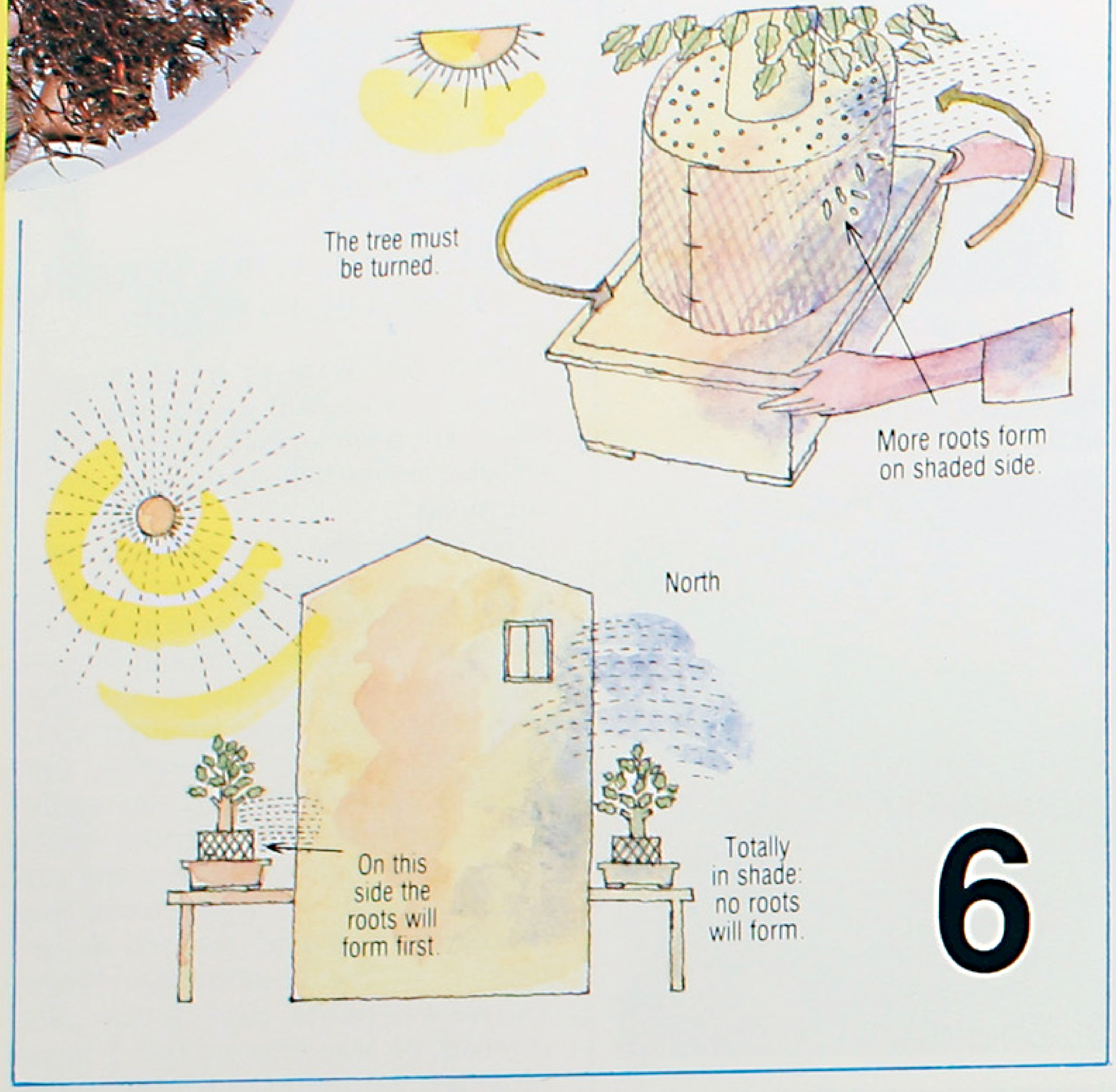
The layering is complete; the tree is prepared so that new roots may form under the best conditions possible.

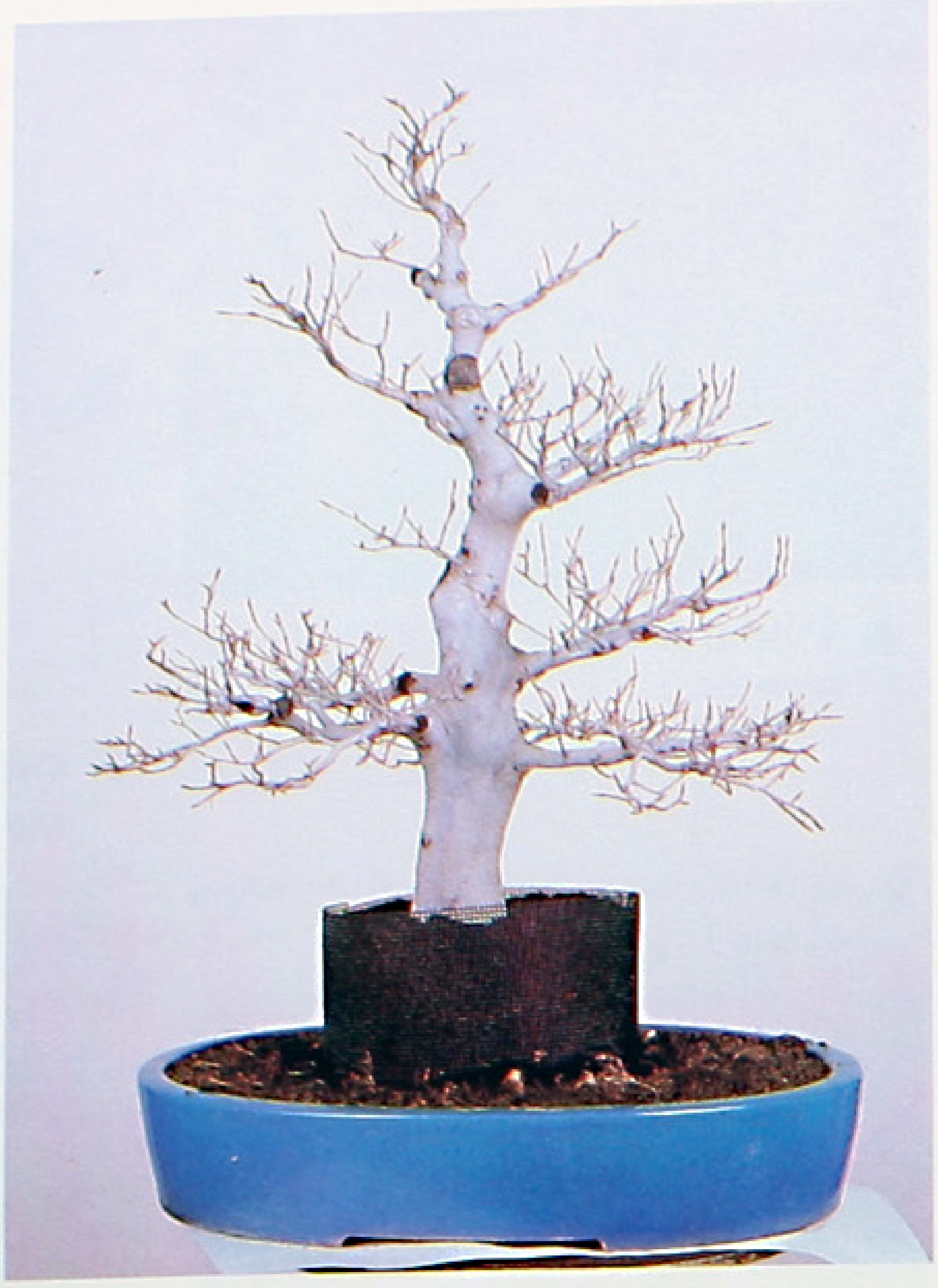
▼ View of layered trees in Hakone.





Put in soil
Drainage layer about 1 inch deep
1/16 inch sand improves drainage


The tree must be turned.
More roots form on shaded side.
North
On this side the roots will form first.
Totally in shade: no roots will form.
6



Once the layering is finished, the tree is taken outside, even if the weather is cold: except that if it is snowing or freezing, the tree should be brought indoors.

the screen approach: in the first place, the drainage is perfect, and so the necessary level of moisture can be maintained, if we water it periodically; in the second place, the wire mesh allows the rays of the sun to reach the soil more directly, and so its temperature is raised more easily, and we already know that the warmth of the soil stimulates the growth of roots. Also, we can see the development of the roots as they push out through the wire mesh.

5. LOCATION OF THE TREE AFTER LAYERING

Once all the above operations have been done, we place the tree outside. We do not put it inside unless it is freezing or snowing. So, in the spring when the soil begins to warm up because of the sun's rays, the sap in the trunk will awaken, initiating the production of little roots around the incision.

6. TURN THE TREE

Although the sun's warmth is good for stimulating root growth, the sun's light is not. So the roots will begin to grow first on the side that receives the sun less intensely. Therefore, the tree should be turned from time to time in order to obtain a balanced root system around the trunk. This does not mean that the tree should be placed in total shade, because if it were it would probably not put out roots at all or, if it did, they would be very weak ones. Turning the tree not only spreads the light and heating effects more evenly, but also causes a better distribution of moisture in the soil. It is very important for the soil to be kept moist at all times.

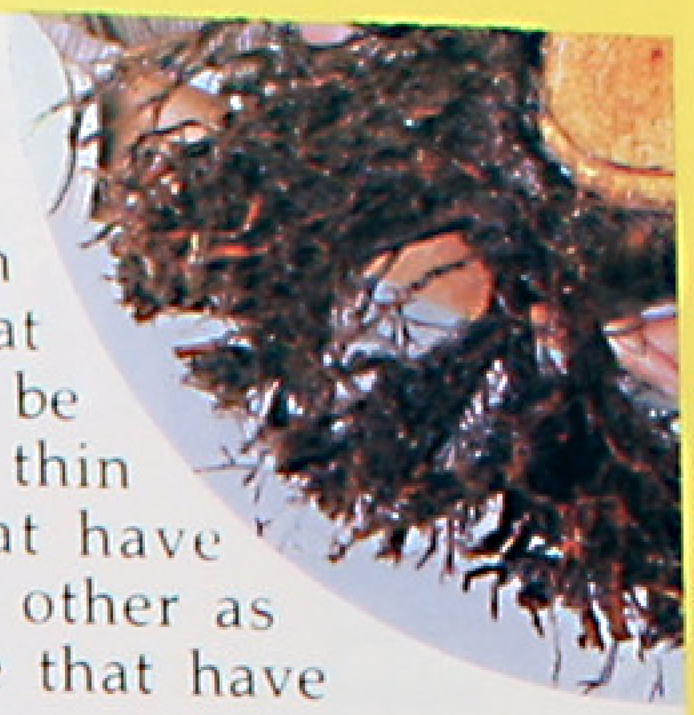
7 IN JUNE OR JULY, ROOTS EMERGE

8. REMOVE THE WIRE AND PRUNE THE ROOTS

At the end of the first year, the soil is removed little by little so that the new roots may be observed. Some will be thicker than others, and, in order to obtain good surface rootage or *nebari*, an effort should be made to make sure that they are all equally vigorous. This is achieved by the first pruning of the roots. With very sharp scissors, cut the thickest roots a little over one inch from the trunk, then cut the finer ones so they are about two inches long. The finest roots, the hair roots, are not cut at all, giving them the opportunity to thicken. At the same time, cut those that grow straight up or down, leaving roots that are essentially radial and at the same level. This is the time to take off the wire, which should be done with great care in order not to damage the little roots. But do not separate the newly rooted section from the tree this first year. Instead, widen the incision, making it about 3/4 of an inch wide and one half inch deep. Then place wire below the roots again. This second wire is the one that will promote the thickening of the base of the trunk, so important in achieving a good *tachiagari*.

9. BEGIN TO FERTILIZE IN THE SECOND YEAR

Once the roots have been pruned, replace the wire screen and soil, and spread sphagnum moss on the sur-



face to help retain moisture. Now the tree may be pruned to improve the design and branch structure, since it will soon be planted in a Bonsai container. As soon as it buds, fertilize with a liquid fertilizer rich in phosphorous and potassium, since these elements favor the strengthening and production of roots. Put it in a place that has some sun but is slightly shaded until the beginning of summer; turn the tree periodically to balance the growth.

At the end of the second year, the number of roots will have increased considerably, and it is time to cut through the trunk below the wire separating the new bonsai from the old base.

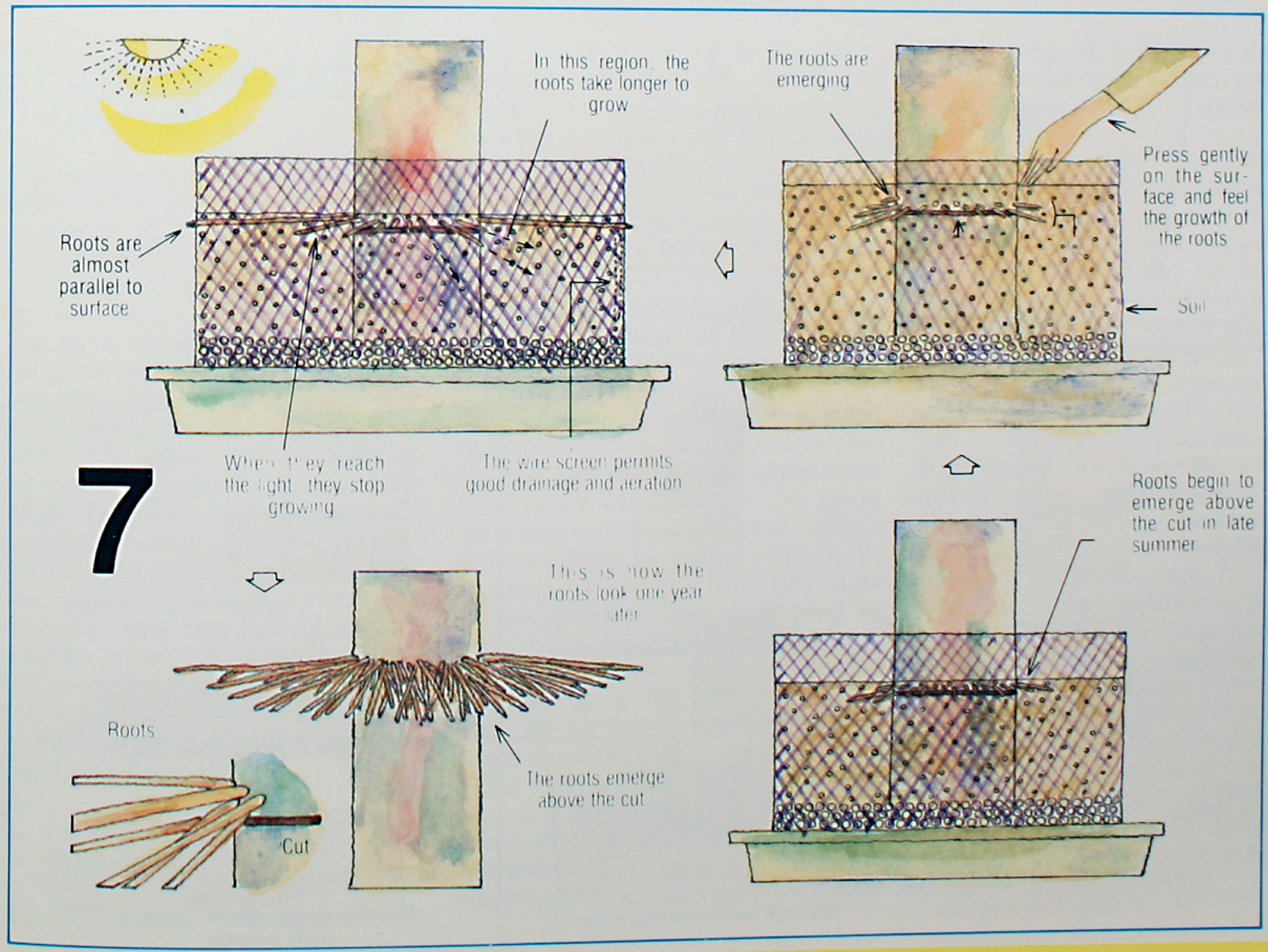
As this is done, great care should be taken so as not to damage the roots. Once the layered trunk has been separated from the stock of the old trunk, very carefully take the wire off, cutting it with wire clippers that have rounded tips. Finally, sealing paste is applied to the cut to avoid letting the water and moisture in the soil rot the base of the trunk. Of the various types of sealing paste on the market, I recommend using for the roots those with a coal tar base, because they dry very rapidly and are permanent.

10. PLANT THE NEW TREE IN A CONTAINER

Now, in just two years, the difference in appearance is appreciable. The Bonsai already has a good root base and pruning has improved the branch structure markedly. Now, the roots are again pruned, and those that grow up or down are eliminated. The choice is now between planting the tree in a long but shallow container or in a training pot. To my way of thinking, this depends solely on whether or not there is a need to achieve good ramification rapidly. In the example that accompanies this text, a training pot was chosen in order to achieve greater branch density; however, in many other cases, I have planted the trees directly into a Bonsai container. Once the tree has been repotted, it is treated like any other recent transplant and its cultivation is straightforward, without any complication. Little by little, as the tree grows, the roots thicken divide, so that in time it will be necessary to thin the roots that have crossed each other as well as those that have dried up, etc.

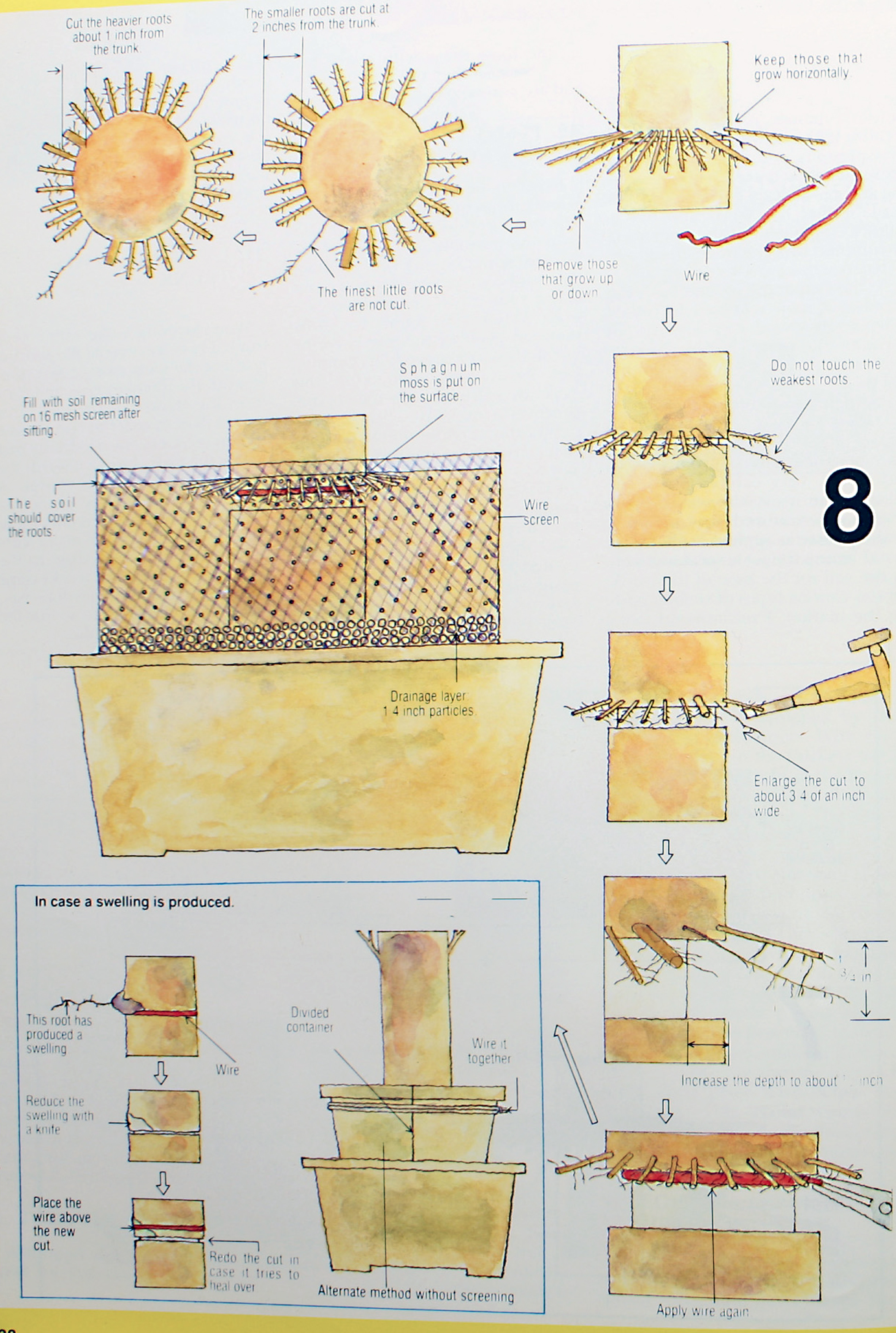
11. LAYERING A TWIN TRUNK

When layering a tree with a twin trunk, I have discovered the peculiar fact that the roots emerge first from beneath the thinner trunk, and then from the thicker of the two. This means that, in order to compensate for this tendency, we need to try first to face the thinner trunk towards the sun as soon as the roots emerge. A year after layering, we prune the roots that come from this finer trunk more vigorously. The major cuts should be made very close to the zone in which the two trunks come together, as shown in the drawings, but with sufficient space so that the slender trunk does not die.



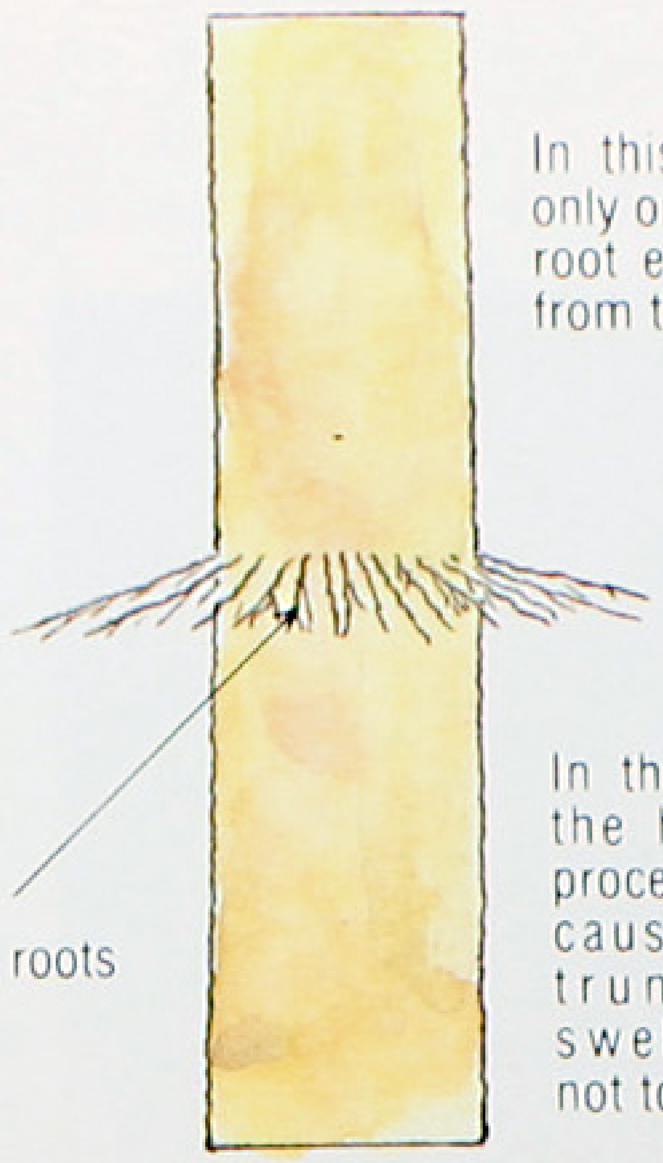
7

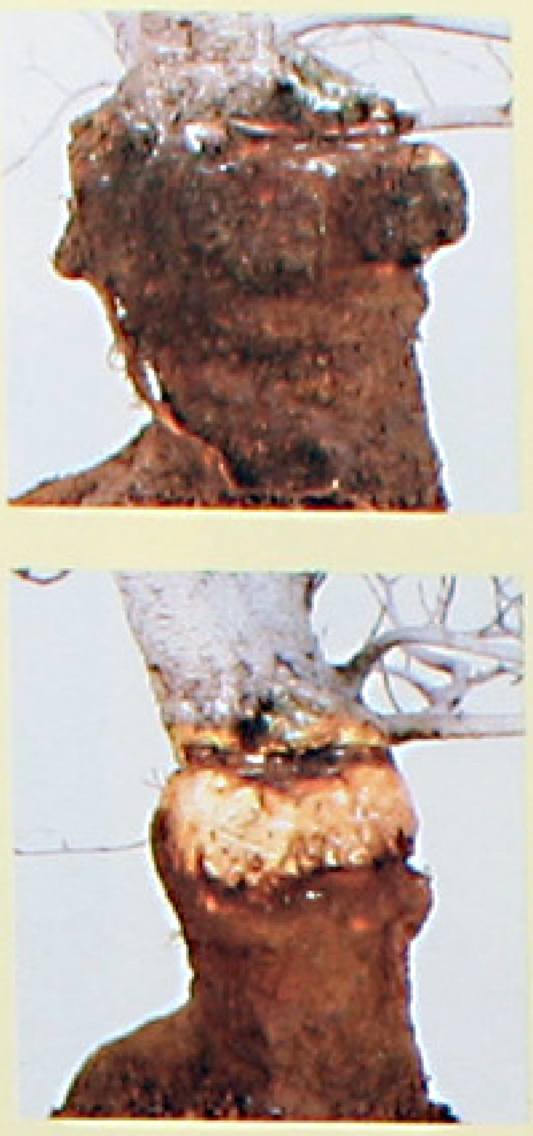
In this region, the roots take longer to grow
The roots are emerging
Press gently on the surface and feel the growth of the roots
Roots are almost parallel to surface
Soil
When they reach the light they stop growing
The wire screen permits good drainage and aeration
Roots begin to emerge above the cut in late summer
This is how the roots look one year later
Roots
Cut
The roots emerge above the cut

Cut the heavier roots about 1 inch from the trunk.
The smaller roots are cut at 2 inches from the trunk.
The finest little roots are not cut.
Keep those that grow horizontally.
Remove those that grow up or down.
Wire
Do not touch the weakest roots.
8
Sphagnum moss is put on the surface.
Fill with soil remaining on 16 mesh screen after sifting.
The soil should cover the roots.
Wire screen
Drainage layer: 1/4 inch particles.
Enlarge the cut to about 3/4 of an inch wide.
3/4 in
Increase the depth to about [illegible] inch
Apply wire again
In case a swelling is produced.
This root has produced a swelling.
Wire
Reduce the swelling with a knife.
Place the wire above the new cut.
Redo the cut in case it tries to heal over.
Divided container
Wire it together
Alternate method without screening

9

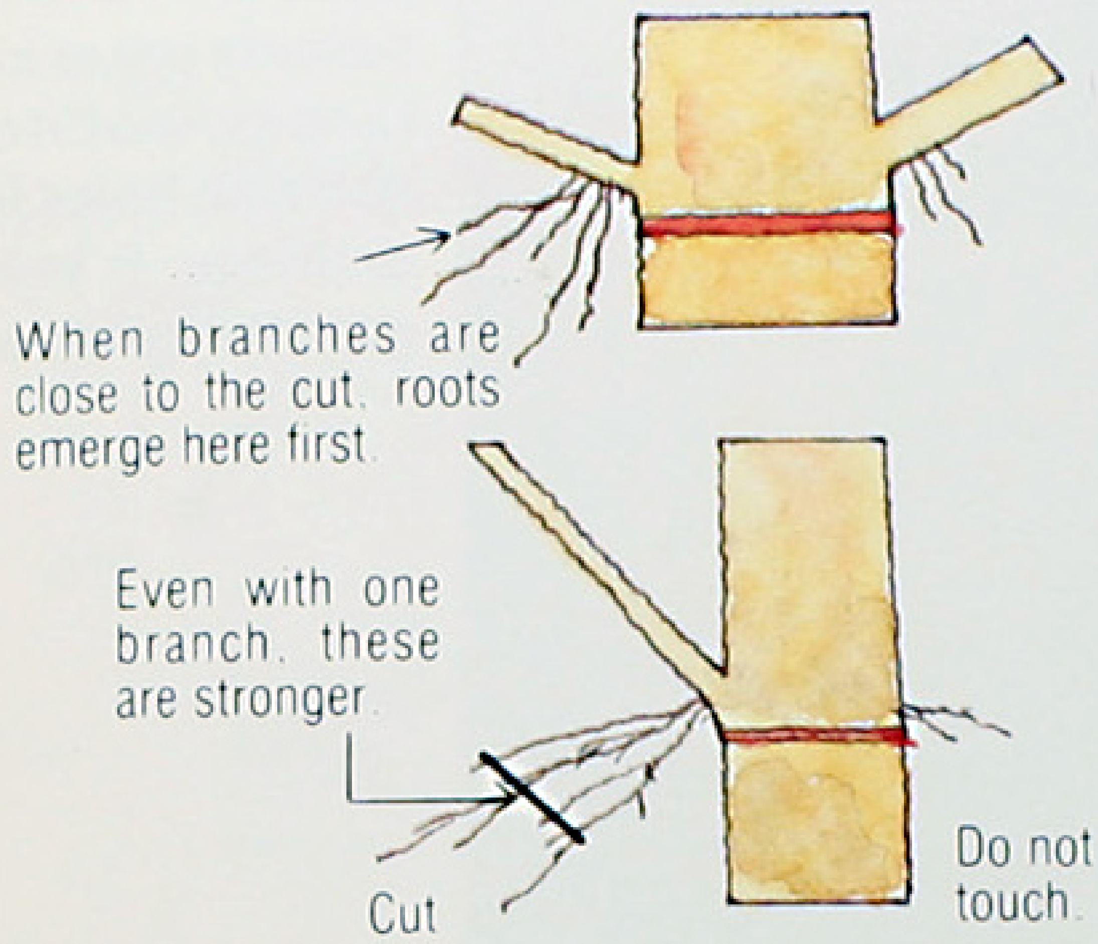
SOME VARIATIONS IN RESULTS

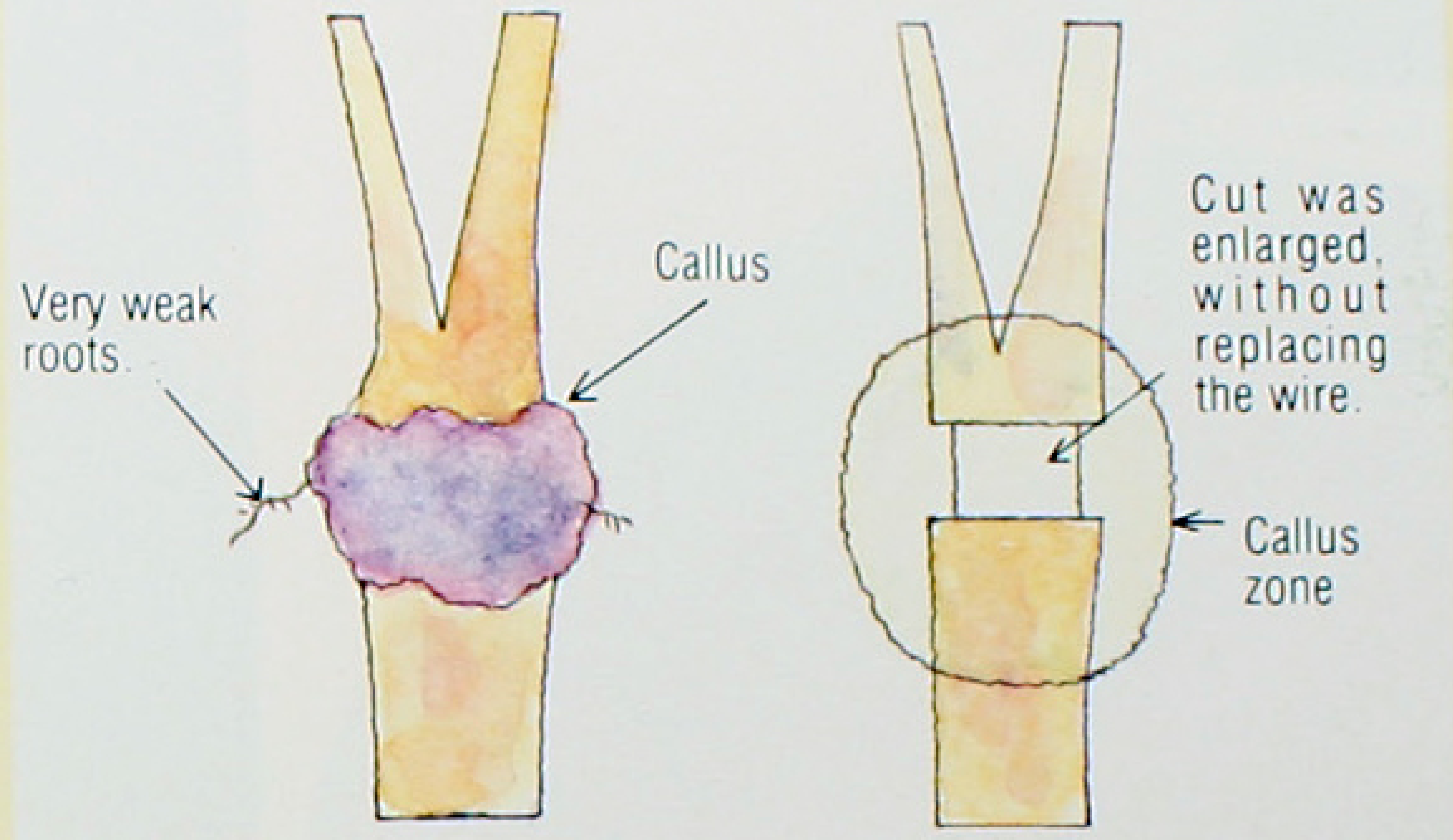

In this case the roots are emerging correctly.


In this case, only one thick root emerged from the cut.

In this tree, the healing process only caused the trunk to swell: but not to root.

This twin trunk was layered.


When branches are close to the cut, roots emerge here first.
Even with one branch, these are stronger.
Cut
Do not touch.


Very weak roots.
Callus
Cut was enlarged, without replacing the wire.
Callus zone

12. LAYERING OTHER VARIETIES

During the eight years I have used this method of layering, I have tried it on almost all the varieties of trees that are normally grown as Bonsai, and I have achieved good results with all of them.

The more difficult species to root, such as the pines and spruces, take three years, instead of two as in all other species, but the procedure is exactly the same. Many varieties were layered at different times of the year to determine the best months for layering. With only one exception, the best results were obtained in the January-February period. The exception was the late-blooming camellias which did best in April-May. With the many varieties of fruit trees, it is best to remove the flower buds so that the tree is not weakened in producing flowers.

13. LAYERING THICK TRUNKS

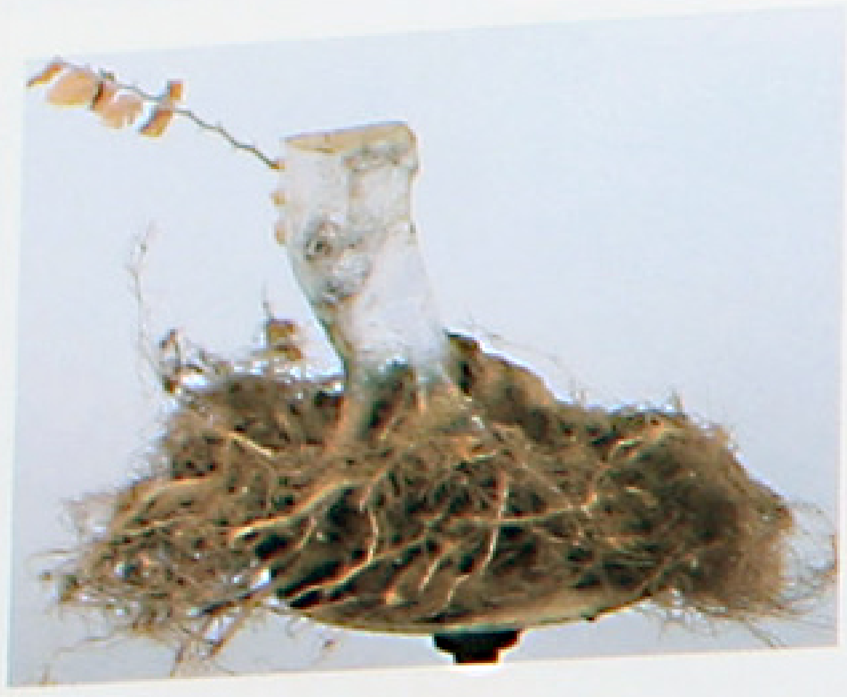
Perhaps it may seem excessive to layer a trunk that is 16 cm [6 ¼ inches] in diameter, since the height would normally be considerably too great for a single-trunk bonsai. But, in this case, I had tried to create a broom-style tree through the process of cutting the top from a tall tree in the nursery, and the cut did not heal over properly. The trunk illustrated in the photographs is indeed 16 cm. in diameter, and it is of the Stewartia species (a tree that is native to Japan, much used because of the copper color of its bark). I made the cut and the tree budded, but the callus that formed and the general appearance were very unattractive. So there were two solutions: get rid of the tree without doing anything more to it, or attempt to layer it. I do not know of anyone who has attempted to layer a tree with such a thick trunk, but I tried it anyway. The technique worked perfectly, and now I am training the tree in order to create a multi-trunk Bonsai.

As you can see, layering is easy and safe to do, and the results are rewarding. In addition, there is the advantage that you can concentrate on the above-ground part of a future Bonsai, without thinking of the root distribution, since, later, you can obtain roots almost wherever you want them.

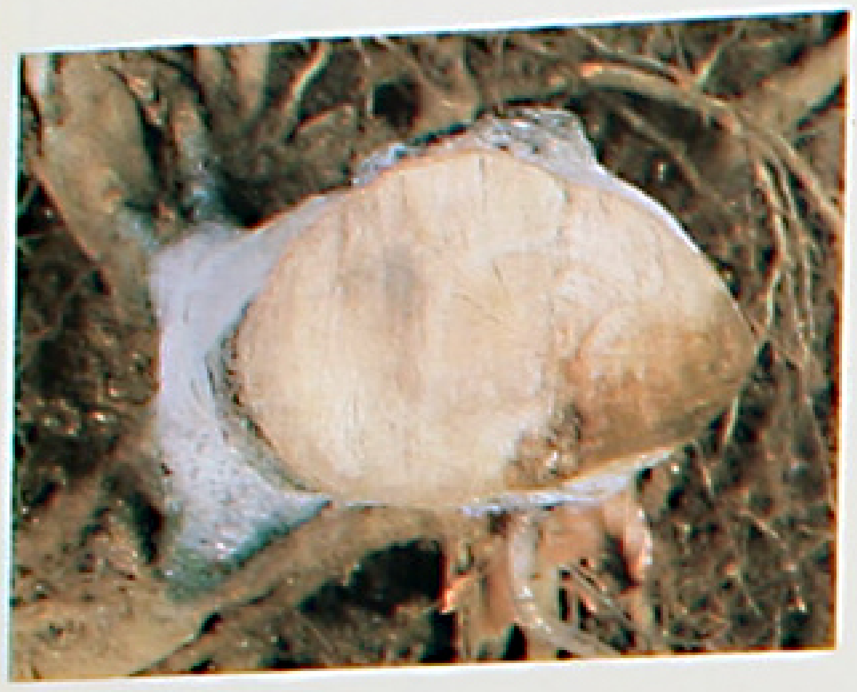
Of course, this method of layering is not one hundred per cent certain. The illustrations in section 9 show some of the defects that may occur. If you look closely, the reasons for them are logical. But unfortunately, defects are always logical after they have occurred, not before.

So, if you wish to learn from my experience, you should avoid layering in the following cases: if you layer near a zone where there are two little branches, on the sides or just above the cut section, roots will probably grow from the branches, but not from the main trunk.

In the case where there is just one branch near the cut zone, roots will grow from the branch before they will from the trunk. This is not entirely bad if you intended it to be a twin trunk, but in the case of a single trunk, the layering will not work well. If it was done to obtain a twin trunk, you should cut the roots of the thinner trunk first and not touch those of the thicker one.

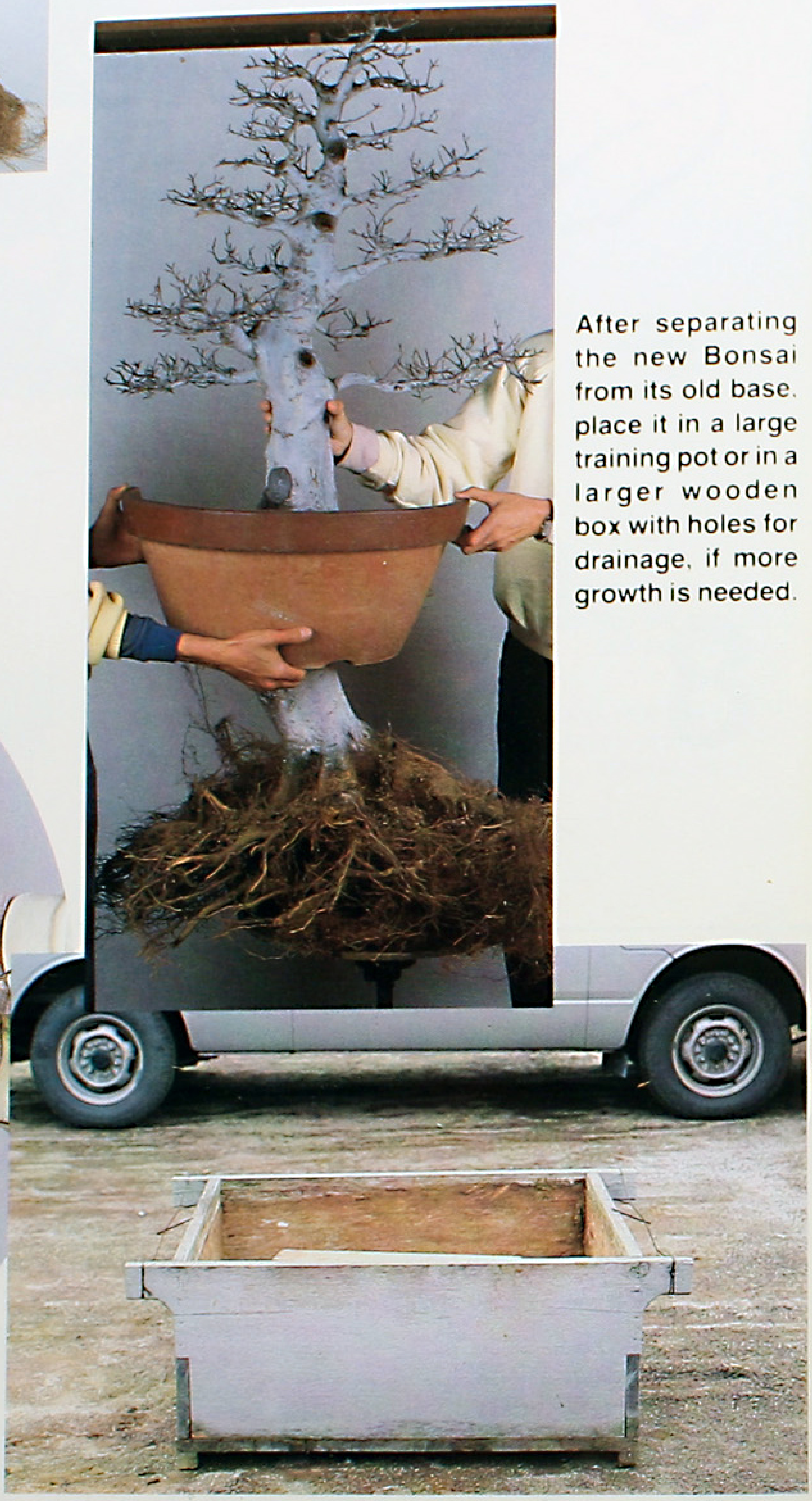


▲ Old roots.

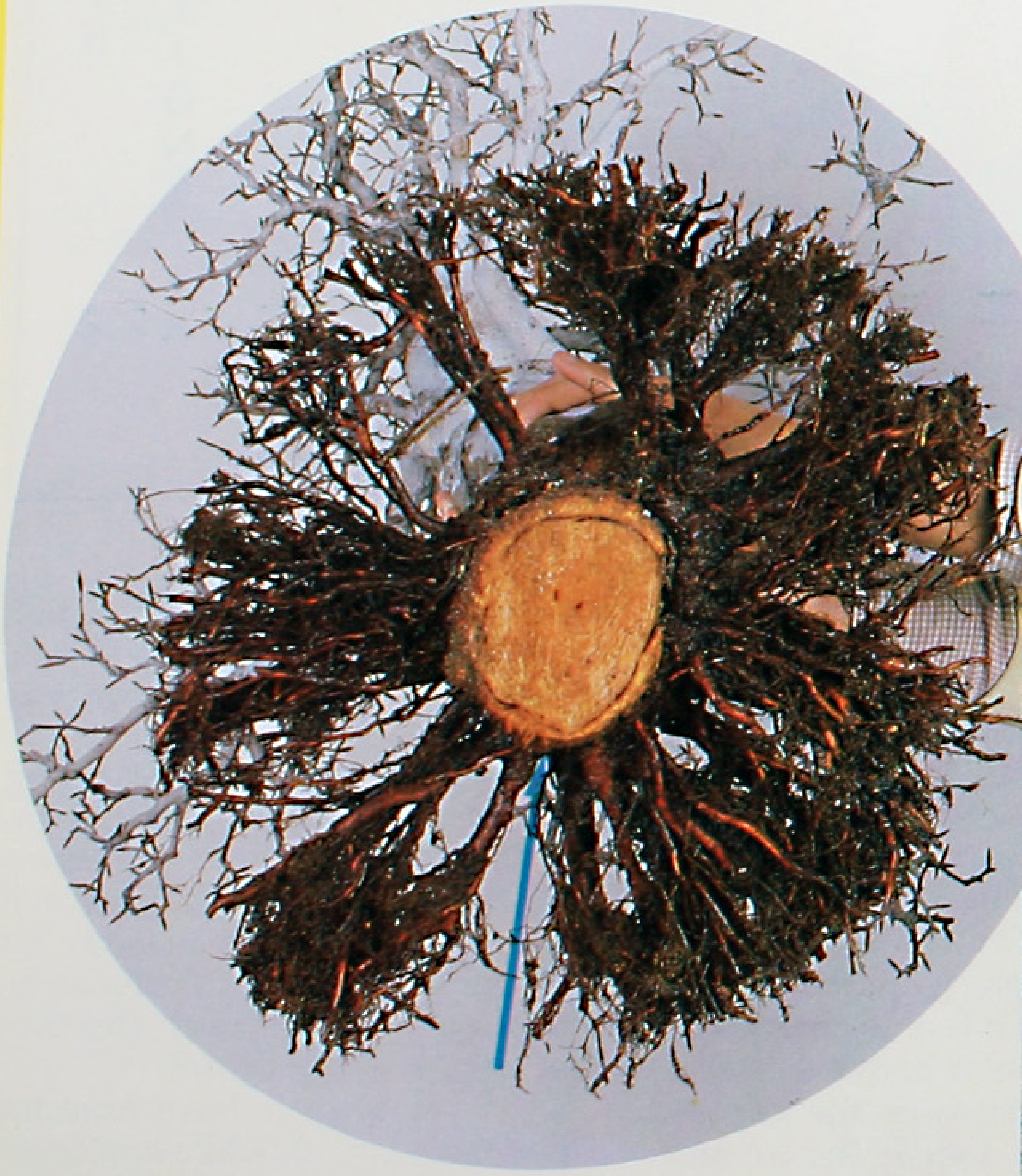


◀ Note that the cut is at an angle.

The tree, prior to removing the old roots. ▼

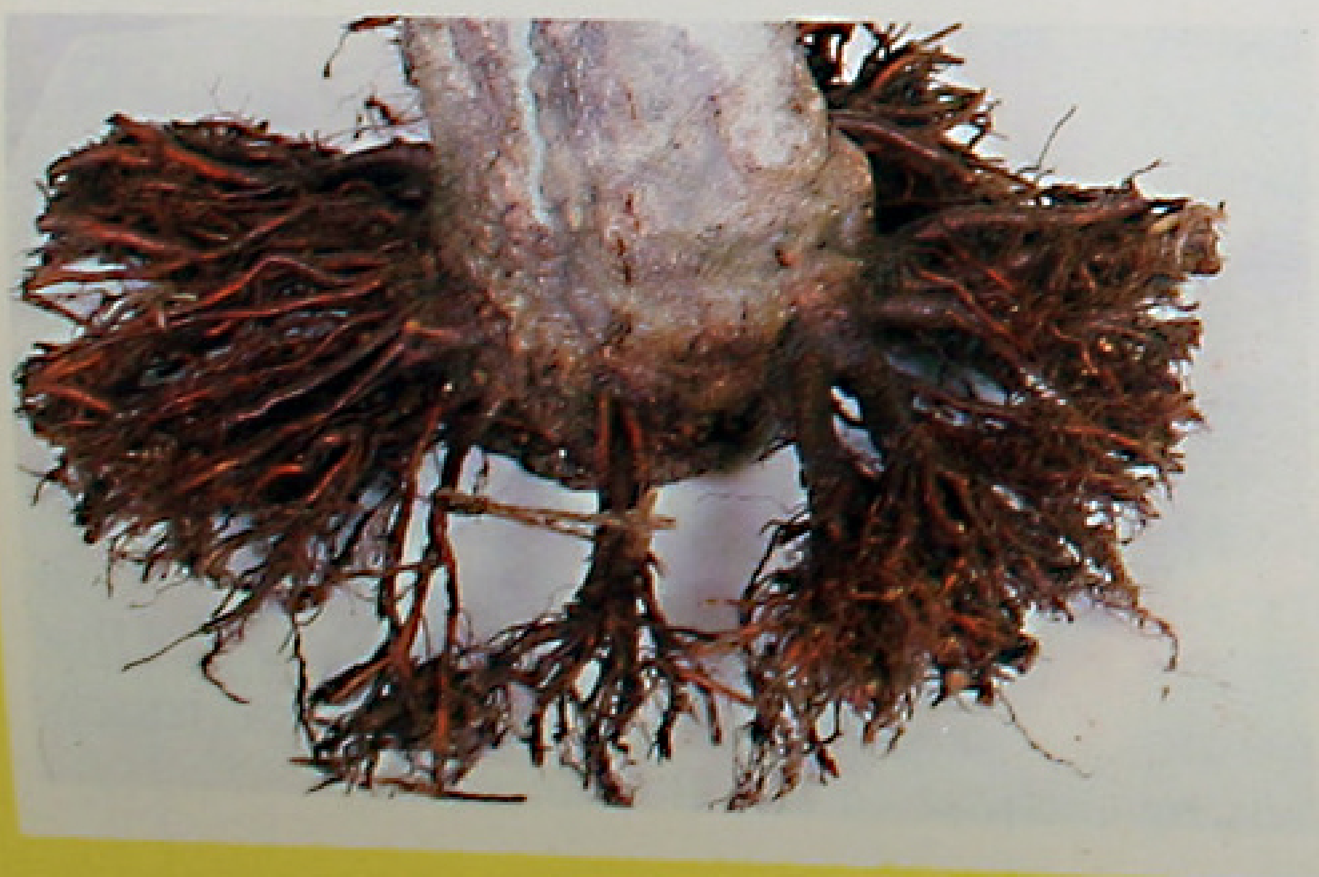


After separating the new Bonsai from its old base, place it in a large training pot or in a larger wooden box with holes for drainage, if more growth is needed.

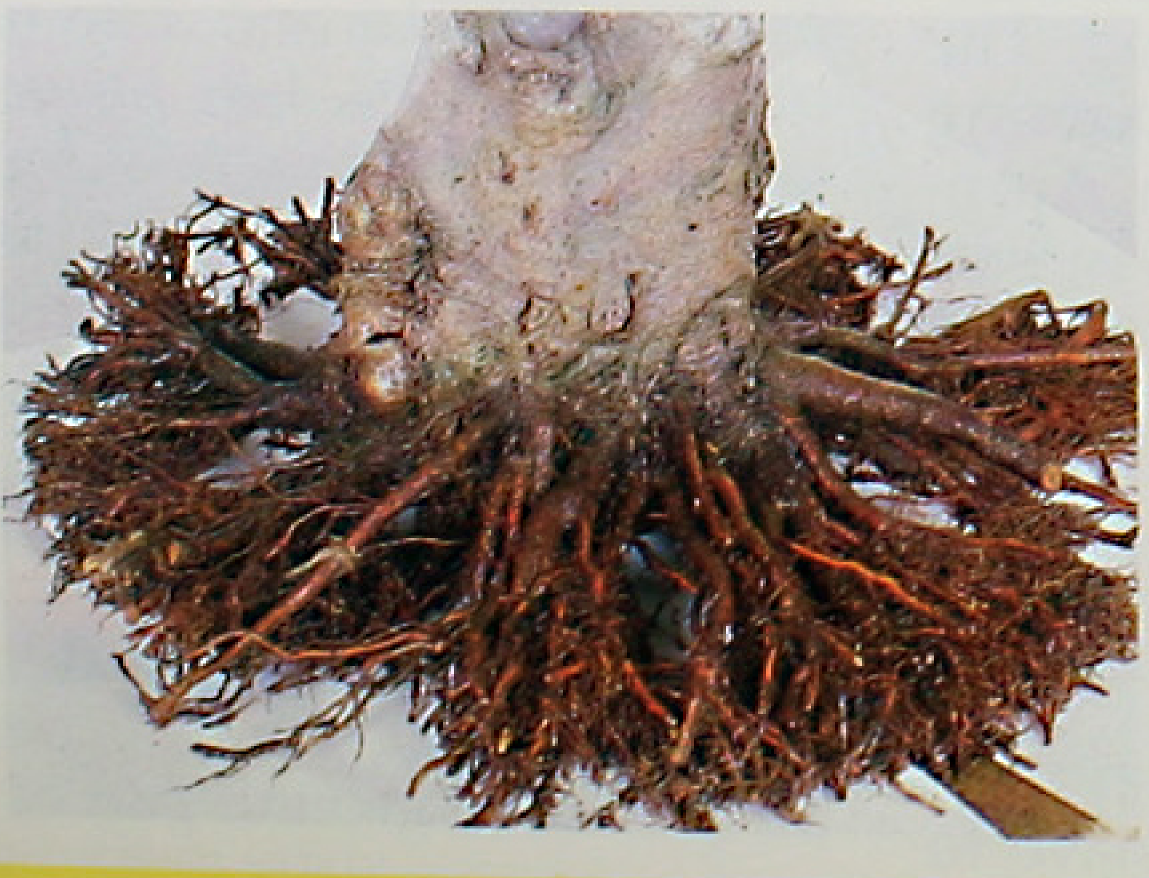


Detail after separation.

Some roots are positioned by tying them together.

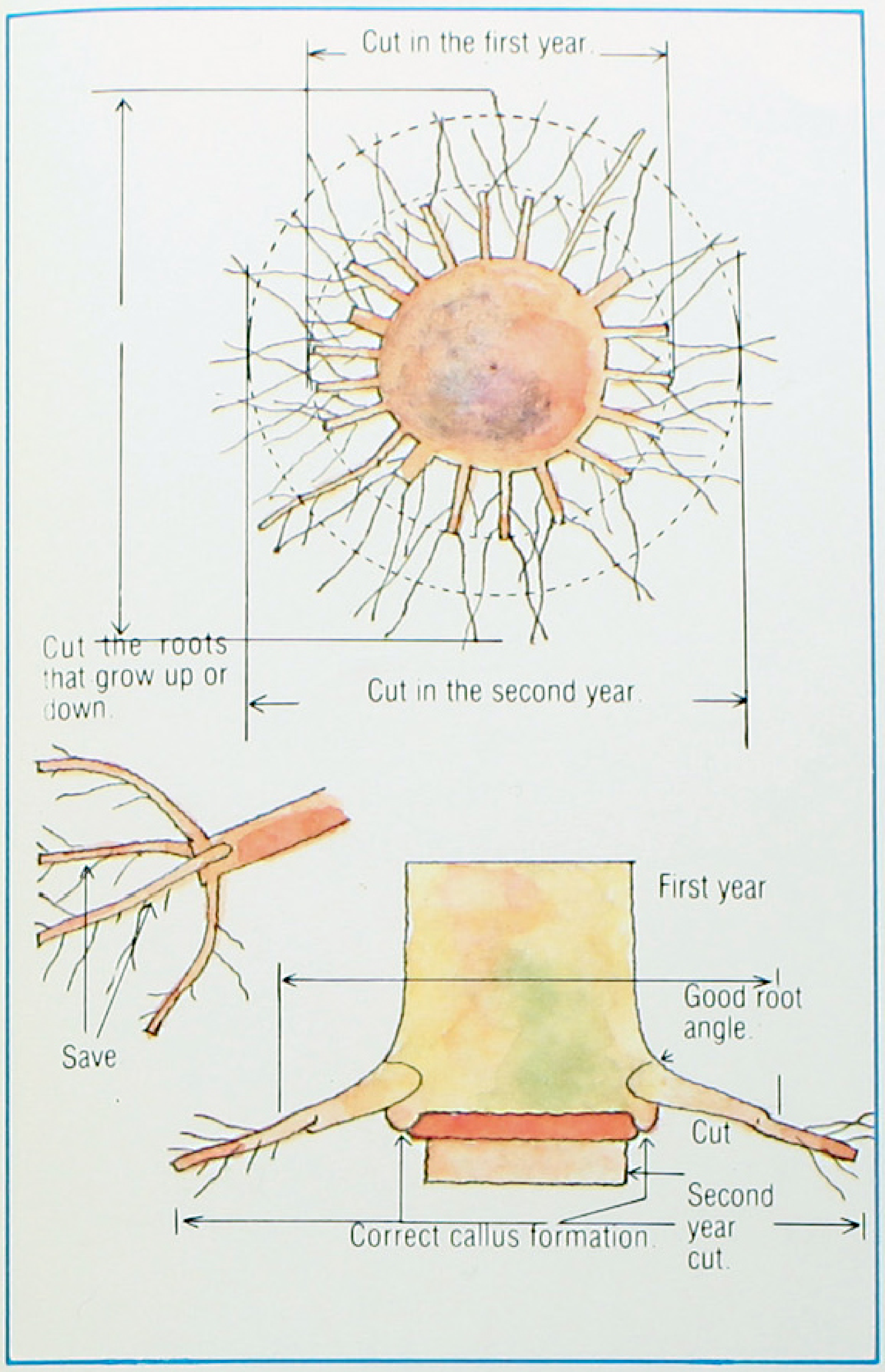


In this way, the distribution and direction are improved.



As you can see, it is possible to place the Bonsai directly into a very shallow container, because of the horizontal nature of the root ball developed in the past two years.

TECHNIQUES OF PROPAGATION: AIR LAYERING

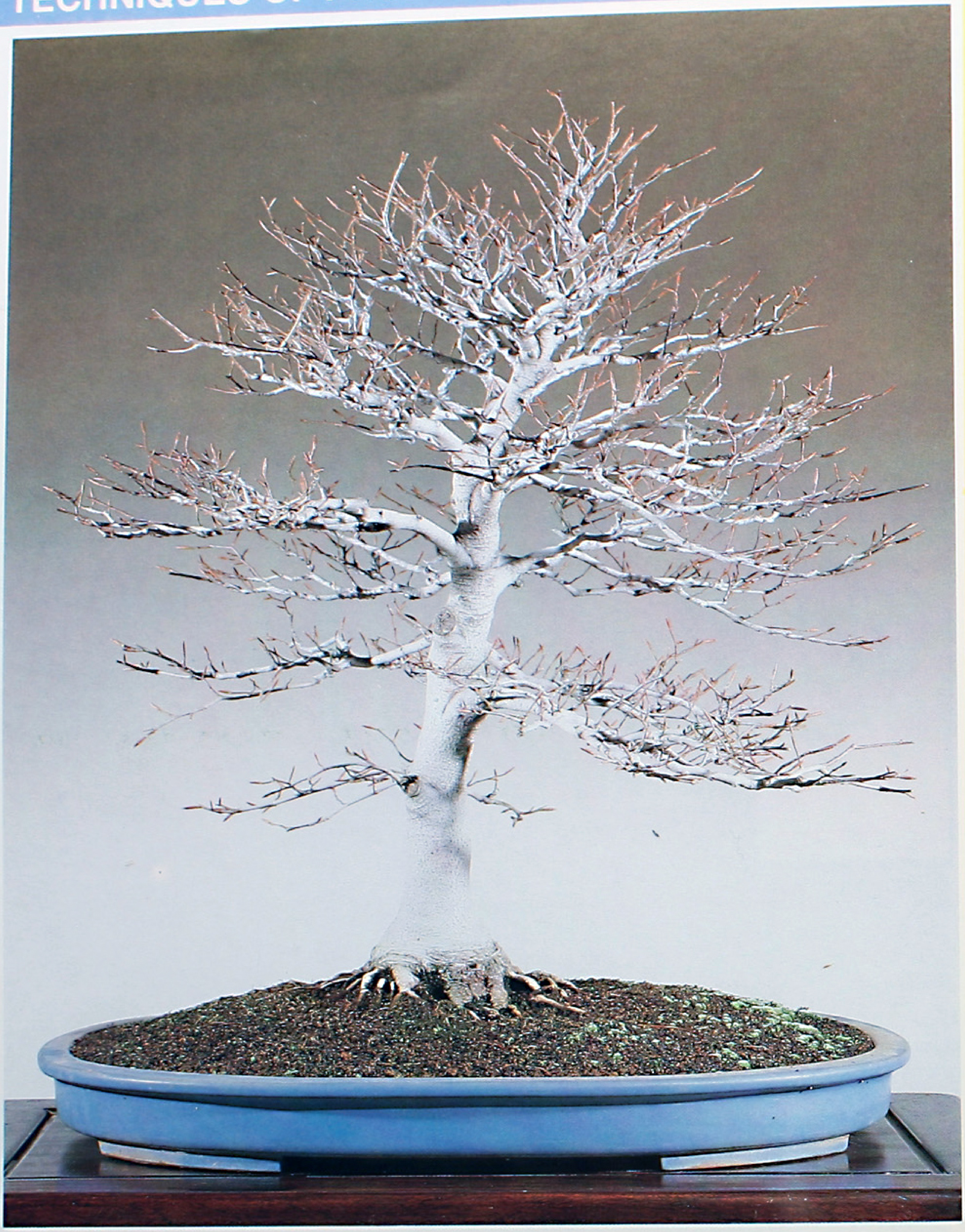


The tree is planted in a training pot.

Appearance of the tree with its new root base.

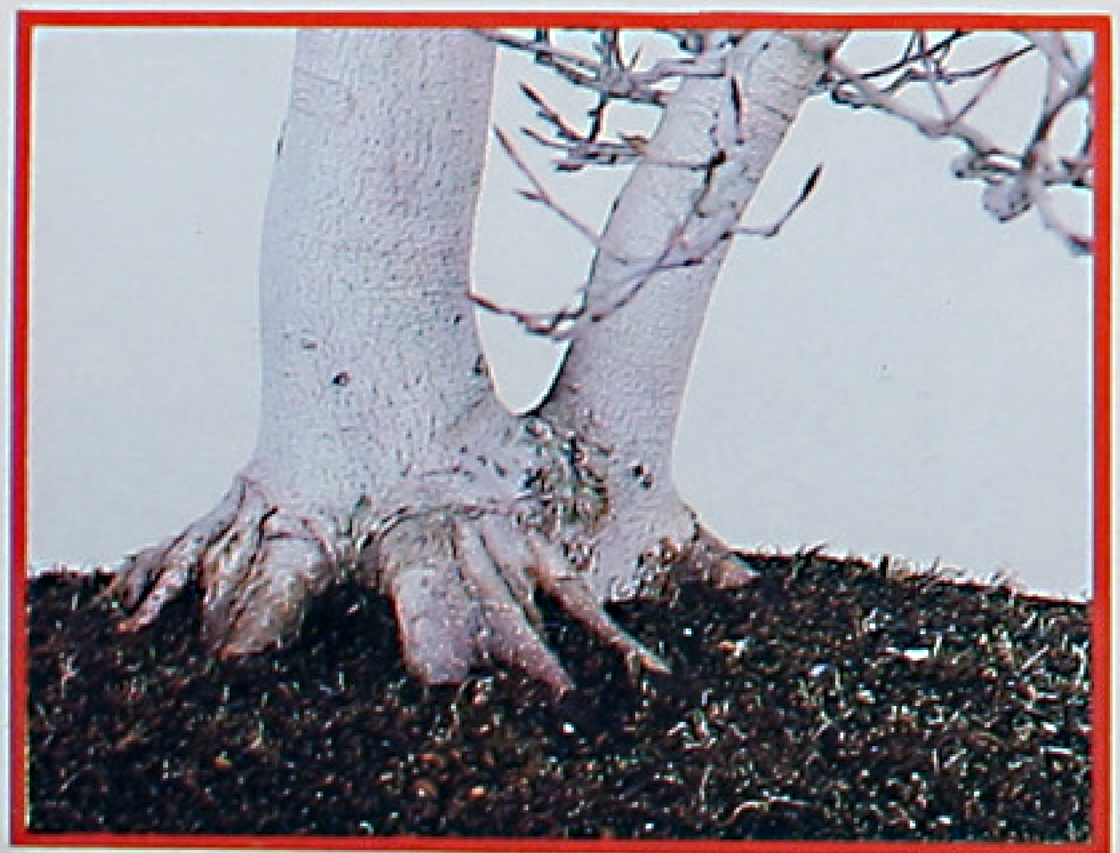
This recently layered tree has great promise. The base is very good; only the structure of the branches needs improvement.

In the above left photograph, another Bonsai obtained through layering. Observe how the root base it now possesses is almost perfect, just three years after layering.



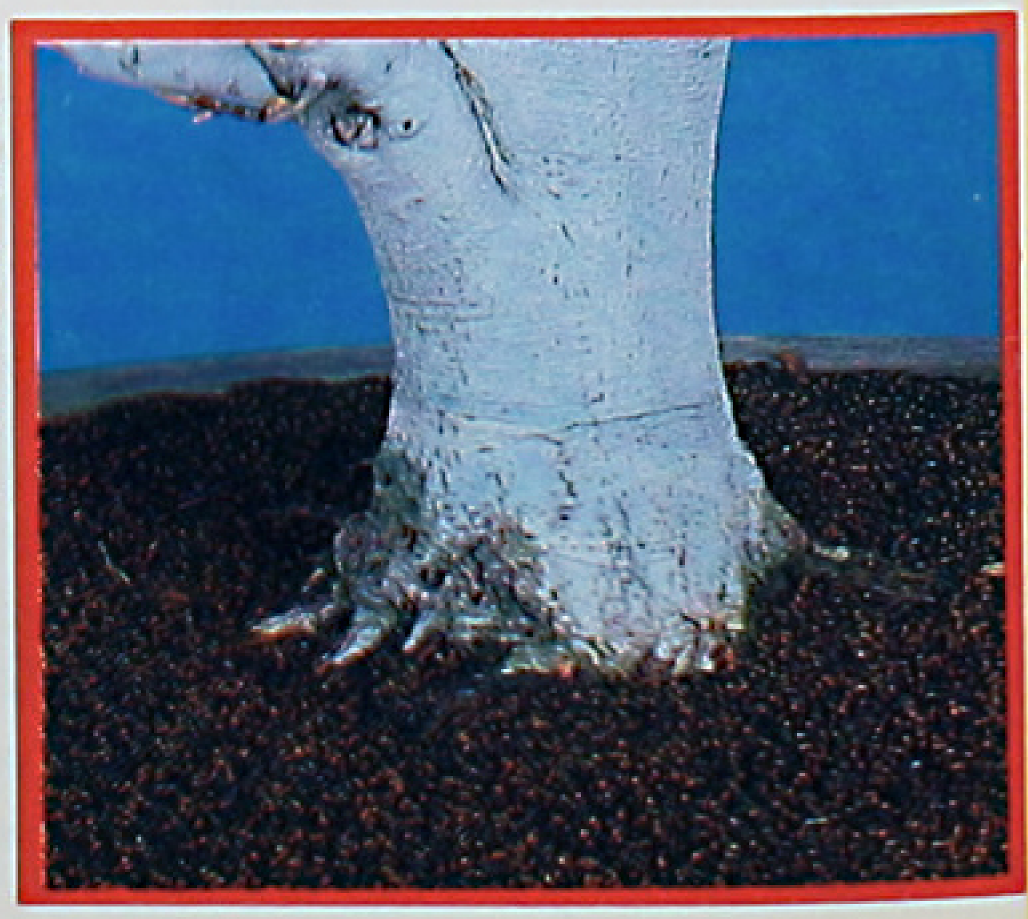
▶ Fagus crenata obtained through layering. Height: 52 cm.

Perhaps this particular beech gives me the most satisfaction. It was one of the first which was successfully layered by this new method and, apart from its aesthetic value, it has great sentimental value to me and my son.



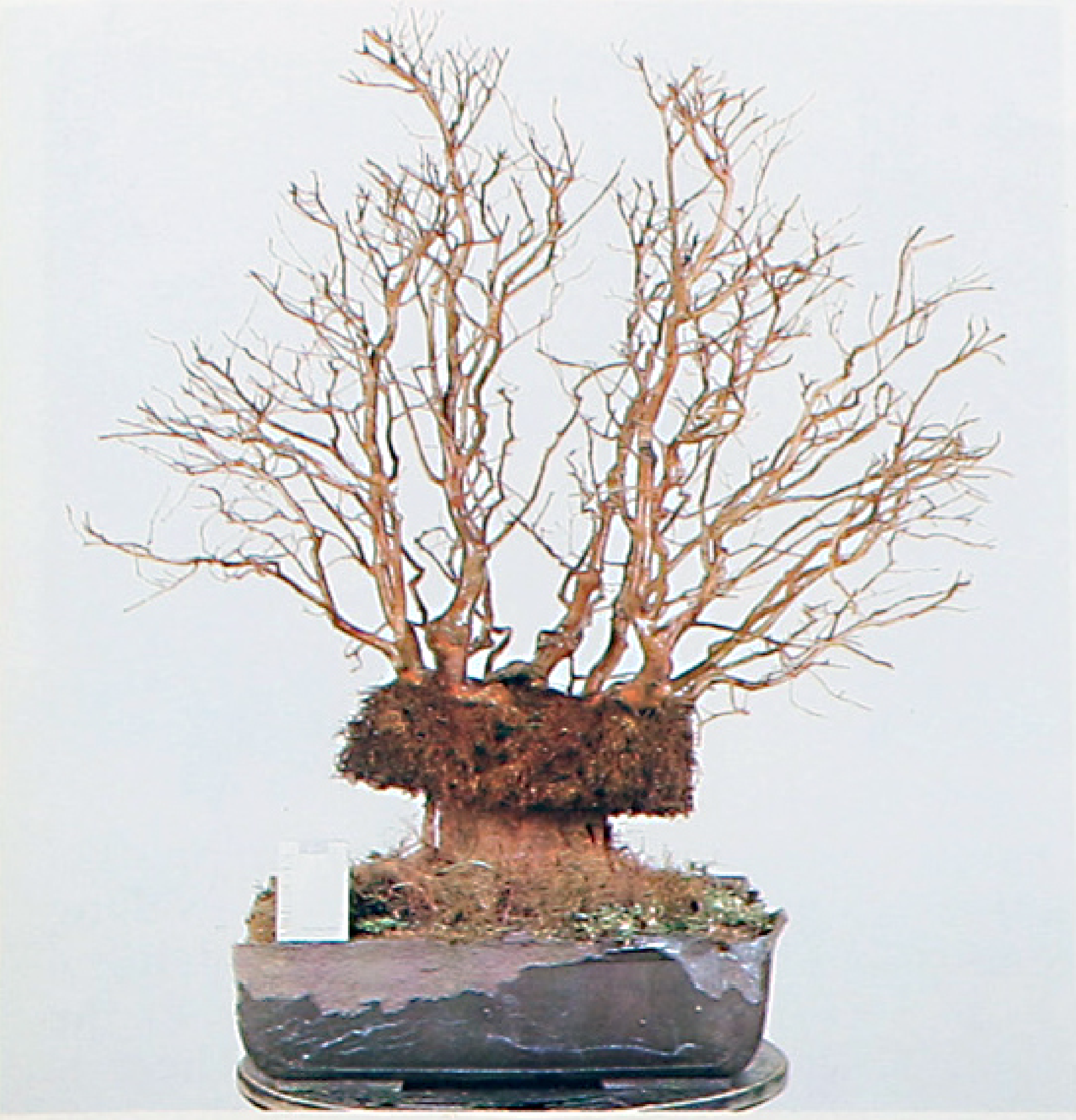
◀ Closeup of the root base of a twin trunk.

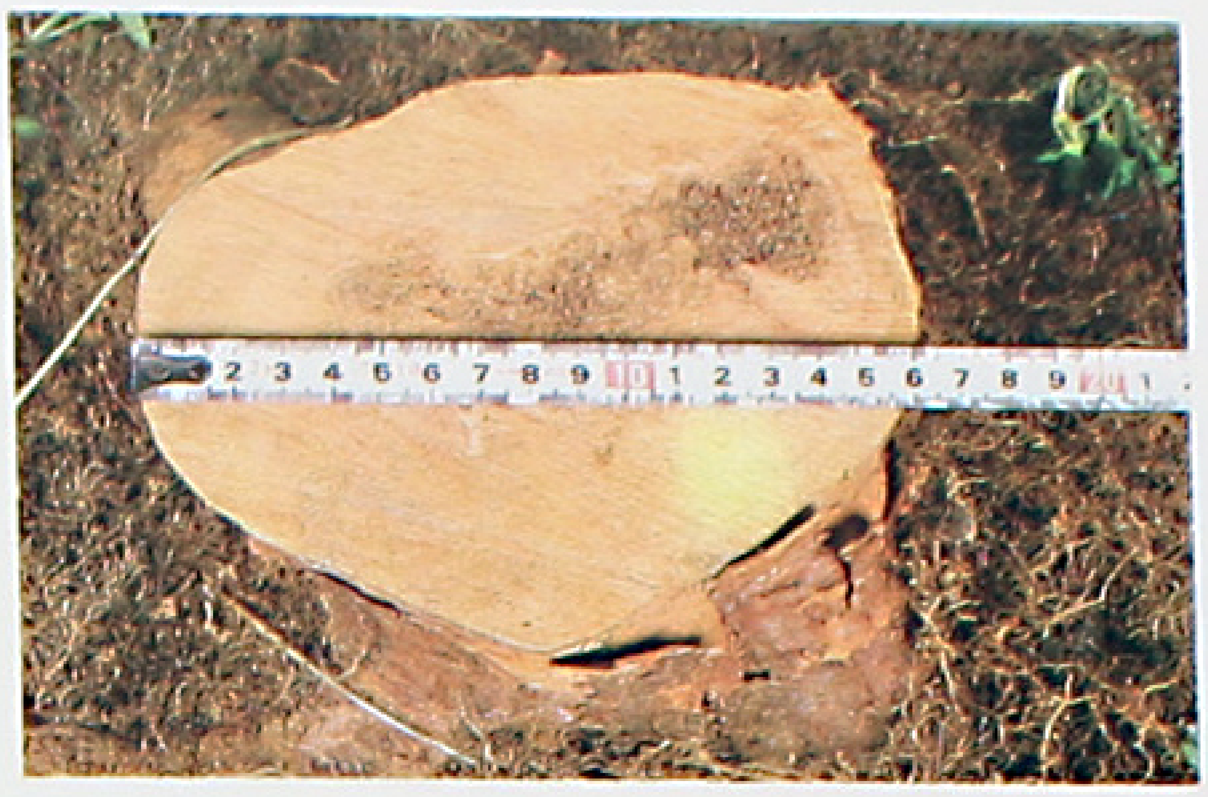
▶ Closeup of the rootage of a tree that was layered two years ago.



◀ Twin trunk obtained through layering a branch.

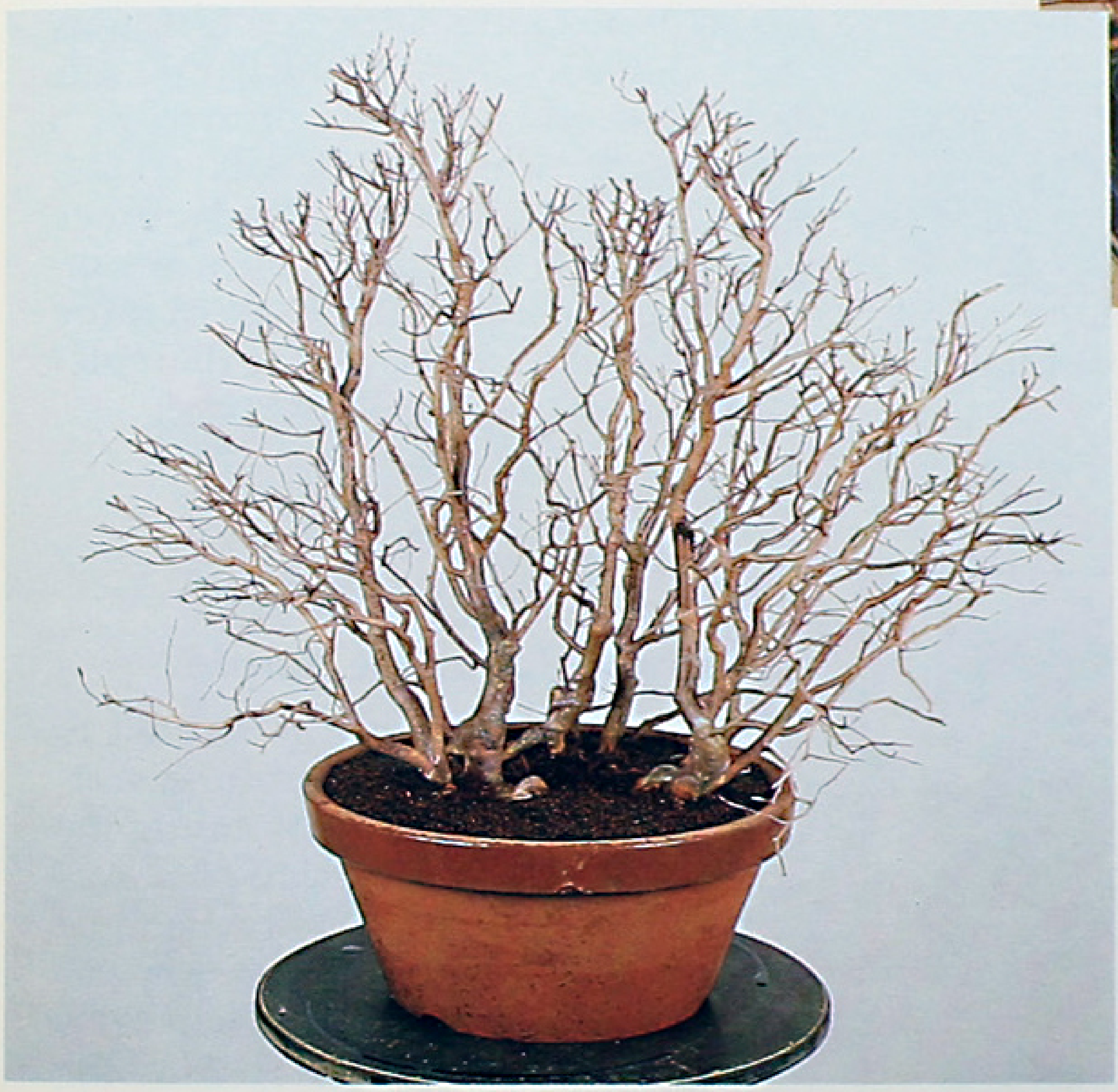
TECHNIQUES OF PROPAGATION: AIR LAYERING





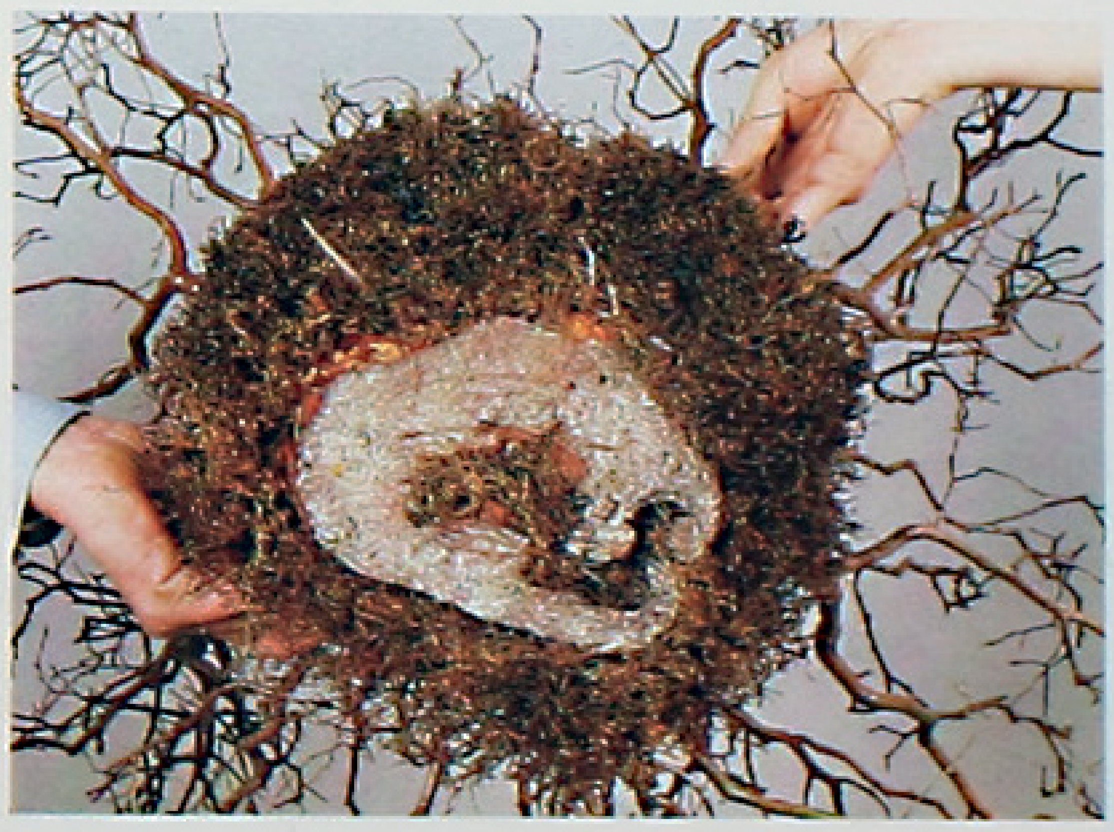
▲ This is the thickest trunk I have ever layered (16 centimeters).

◀ Layering a Stewartia monadelpha.



◀ After layering.

▼ View of the new root ball.



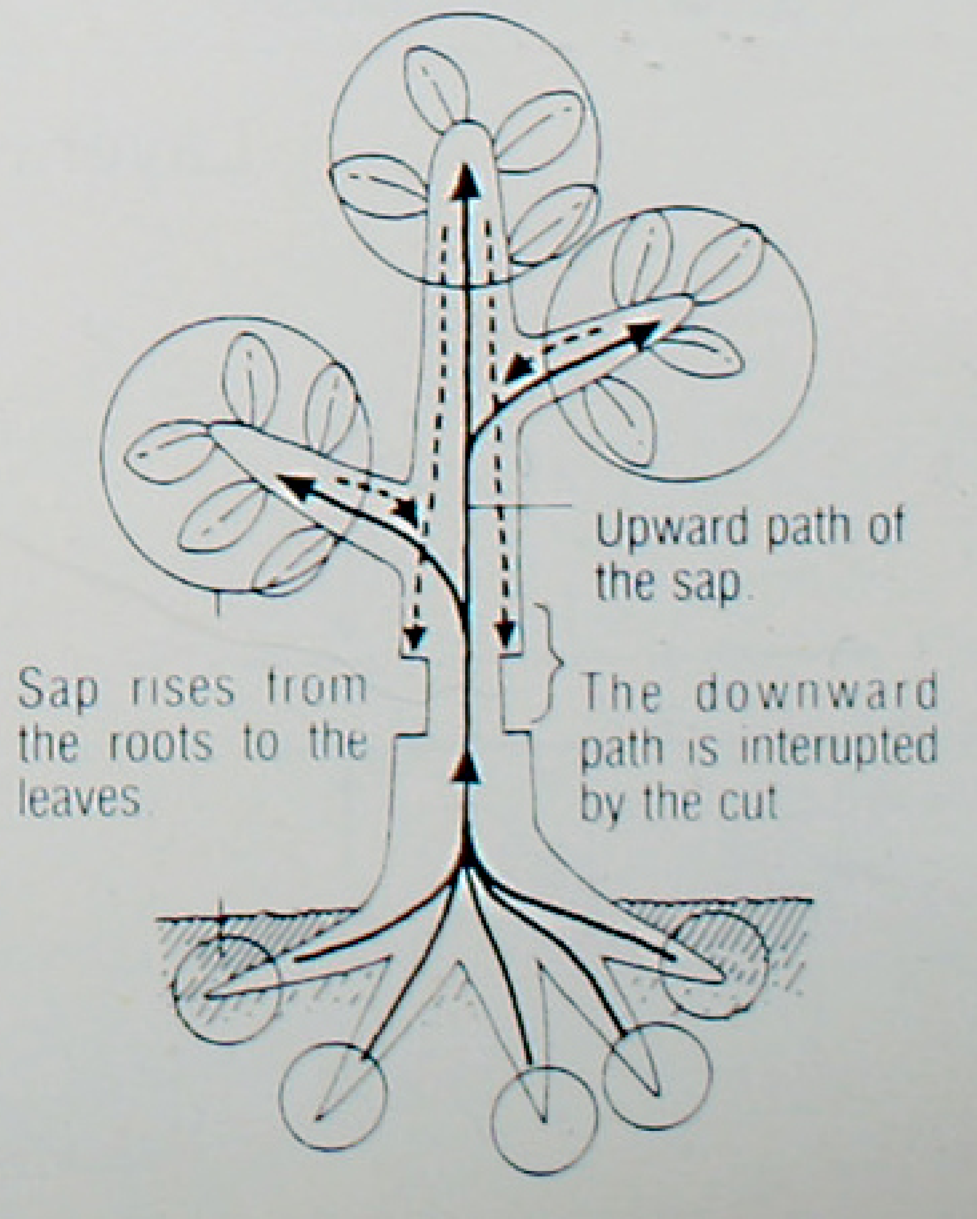
Stewartia

The illustrations on the left show the trunk of the Stewartia referred to some pages before. As you can see in the first photograph, it was a pity that an unsightly callus had formed, because it could have been a good broom-style bonsai. Even so, I tried to layer it, and the result was surprising. In just two years, the layered part rooted, and I was able to separate it from the stock, and so I am now training the trunks in a multi-trunk style. What's more, the lower part, the tree's stock, is budding again, so now I have two trees which have possibilities as future Bonsai. To avoid heavy callus formation near the new buds, I have wrapped the zone where the new twigs are growing with tightly tied raffia.

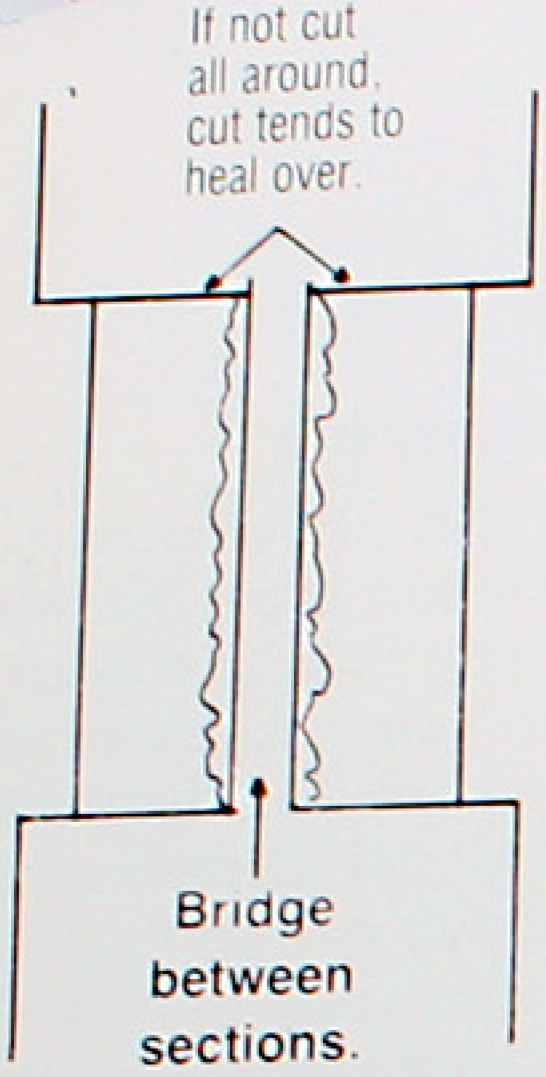
WHY DO LAYERED TRUNKS ROOT?

The reason that layered trunks are capable of producing roots is easily explained. There are sap paths in the tree, which conduct the sap upwards in interior vessels from the roots to the leaves, and once processed back to all the parts of the tree in a descending manner through ducts in the inner bark. Just below the inner bark (phloem) is a thin layer of cells called the cambium, which can produce either leaves or roots, depending on whether it is exposed to the air or buried. For the cambium layer to begin to produce new cells, it must be stimulated in some way; the tree, naturally, chemically stimulates this zone in order to thicken the trunk and produce branches and roots. In fact, just by burying a part of the trunk without effecting any cut, it will probably root, but if we want to accelerate the process of creating roots, the cambium should be stimulated in another way, such as by wounding or injuring it, so that the it will respond to the new condition in the shortest possible period of time.

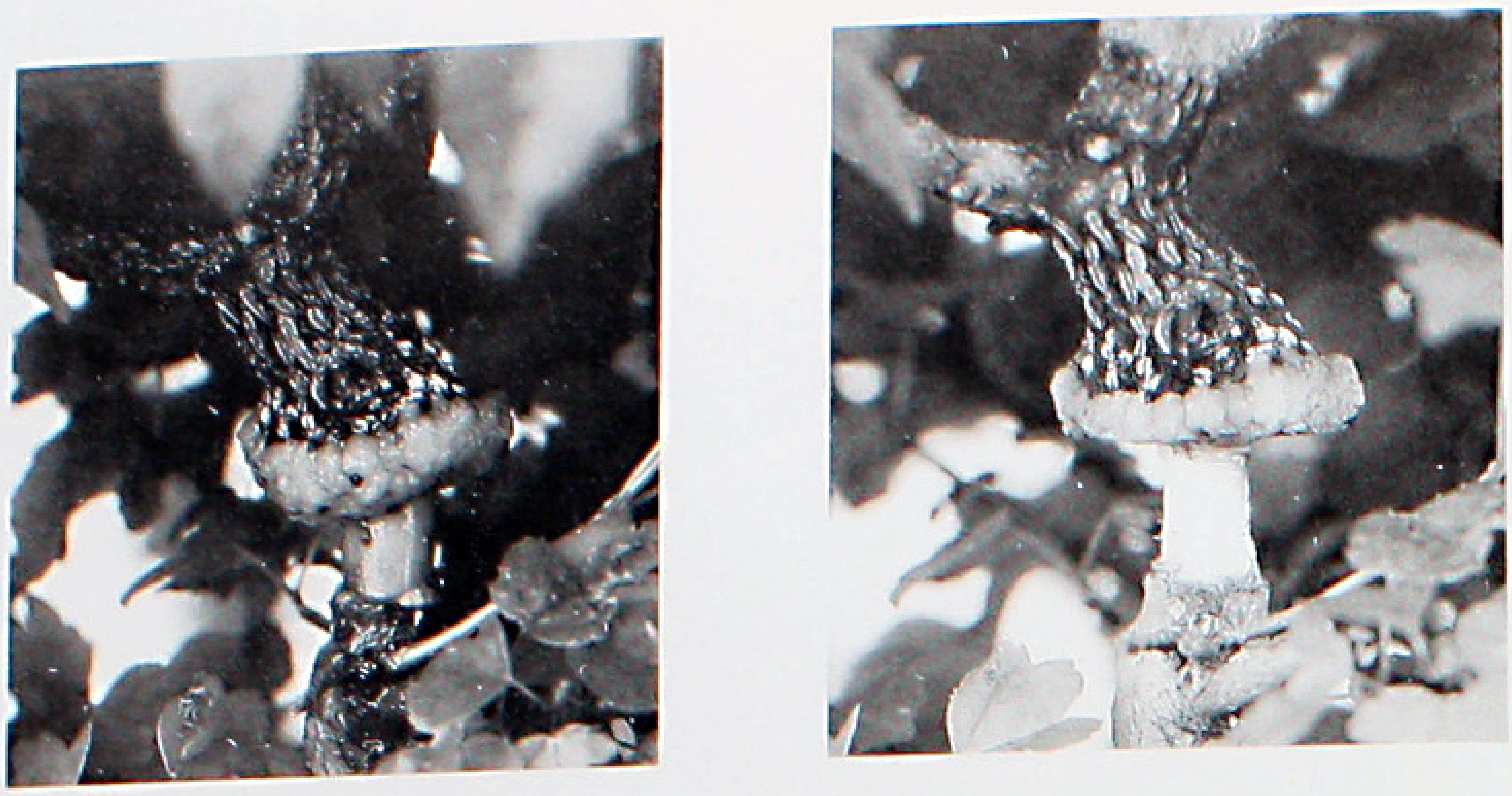
When the bark is cut through the cambium layer and into the sapwood (xylem), the descending path of the sap through the ducts in the inner



Upward path of the sap.
Sap rises from the roots to the leaves
The downward path is interupted by the cut



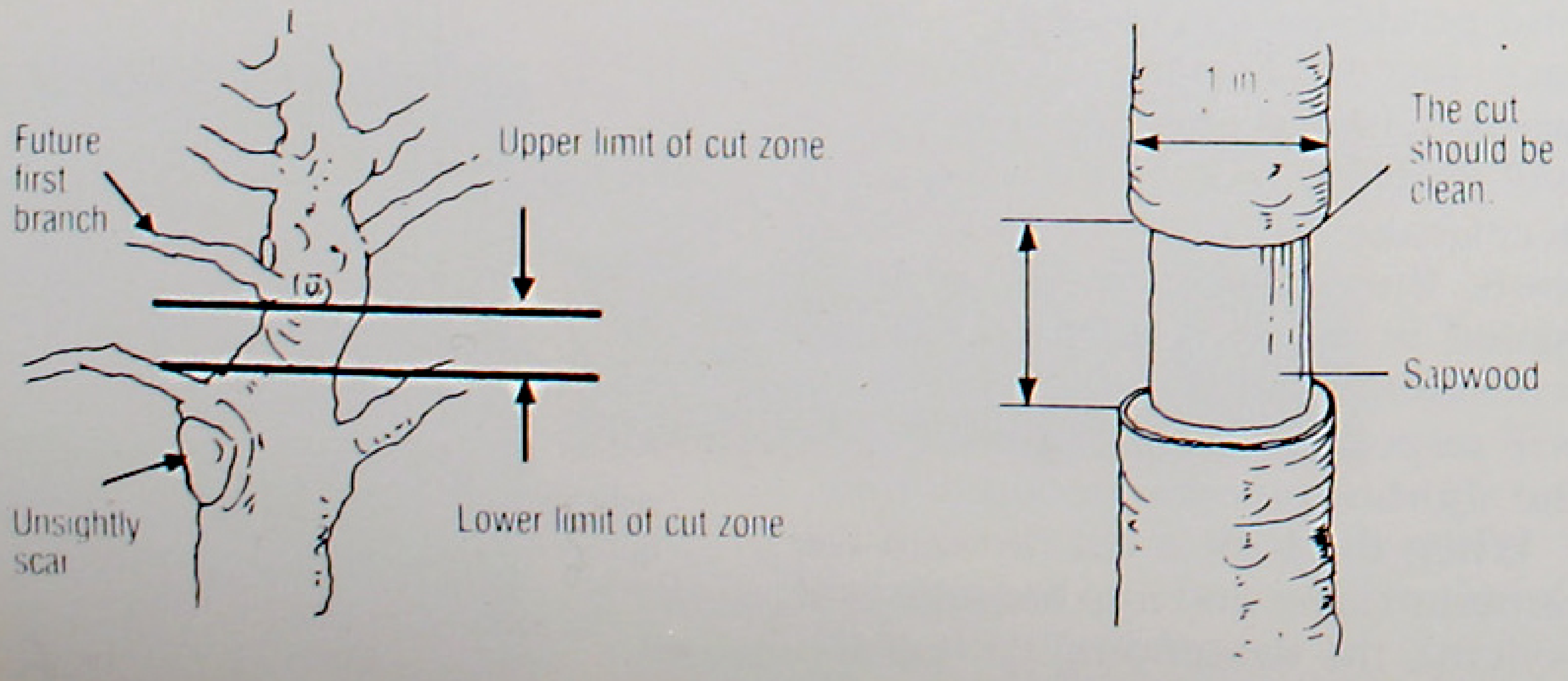
These ▶ photographs show the swelling that is produced before the emergence of the new roots.



bark (phloem) is interrupted. This interruption causes all the nutritive substances processed by the leaves to accumulate in the upper part of the cut, stimulating the cambium layer to react in some way. One reaction could be to heal over the wound to reestablish the sap's flow; another reaction is to adapt to the new condition, and since the cut is moist, with earth around it, and in the dark, the conditions are optimum for the development of new roots.

In fact, the procedure that ensures with greatest certainty that the desired reaction takes place is that of making a circular cut all around the trunk, sufficiently wide so that the tree has no opportunity to heal over the wound. The procedures that, on the contrary, leave some pathways of bark intact, tend to stimulate a healing reaction rather than producing roots, and this leads to swelling around the layered area, giving a very unnatural appearance to the *nebari* [surface rootage]. There is another method of layering that consists of making little rectangular cuts, like windows, in the trunk; this latter procedure is used primarily on trees that root very easily (ficus, elms, poplars), but the disadvantage is that the roots grow in bunches instead of spreading themselves more regularly around the whole diameter of the trunk.

Layering a maple



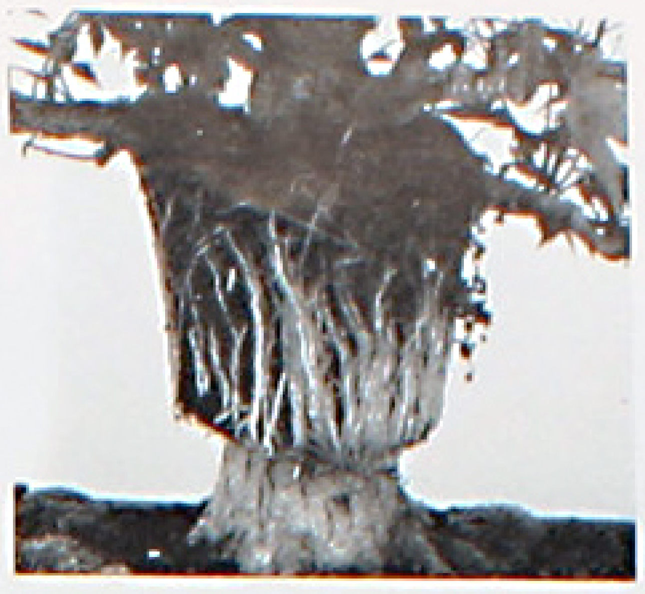
Layering a Japanese maple

This acer palmatum was layered to eliminate a very visible pruning scar. There was no other way of hiding the scar, since in the area where it was located, the growth of the branch just above it only highlighted its appearance. Therefore, a new growth level for the roots was chosen, considering the relative thickness of the trunk, the placement of the branches and the future height of the tree. An added bonus was that the inverse taper of the trunk would be corrected with the thickening that the layering would locally produce.

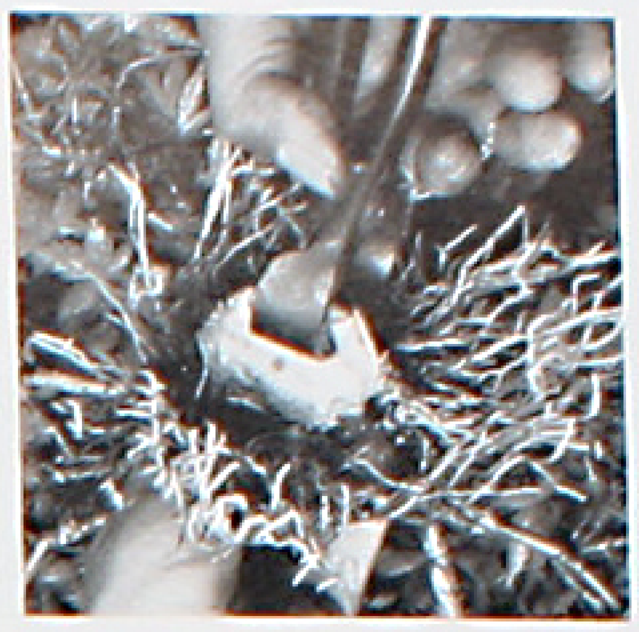
A ring of bark with a width equal to or slightly greater than that of the diameter of the trunk was removed. This was to ensure that the tree would not attempt to heal the wound. Instead of placing screening on the base soil and building up to the layered region, a plastic container cut in half and tied in place was used. At the end of one year, it was taken off, and there was a new root ball, of sufficient development to ensure the survival of the upper part of the tree when the old base was cut.

Once the stock was cut, it was

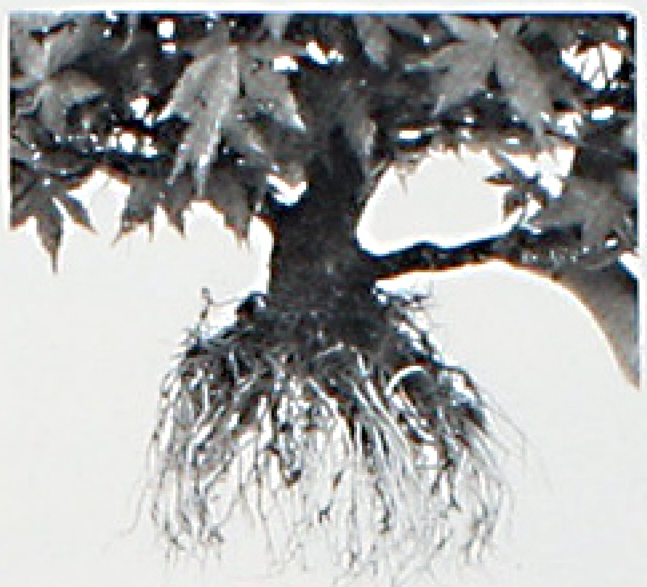
TECHNIQUES OF PROPAGATION: AIR LAYERING



▲ The layered tree one year later.



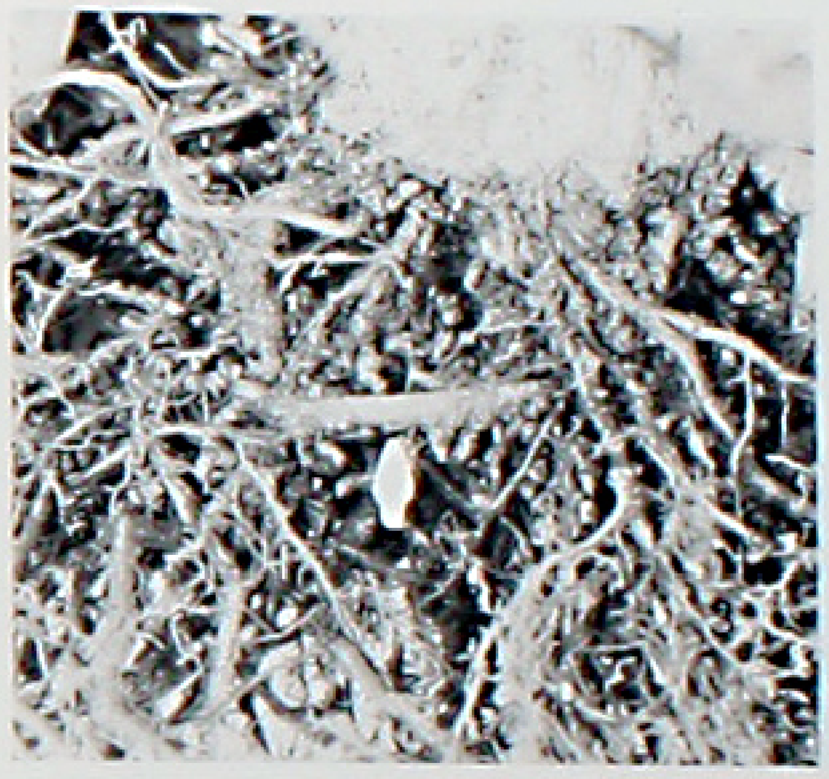
▲ The new root ball viewed from below.



▲ The branches are allowed to grow to encourage root formation.

◀ The tree is separated from the old trunk.

▶ ...And planted in a training pot.

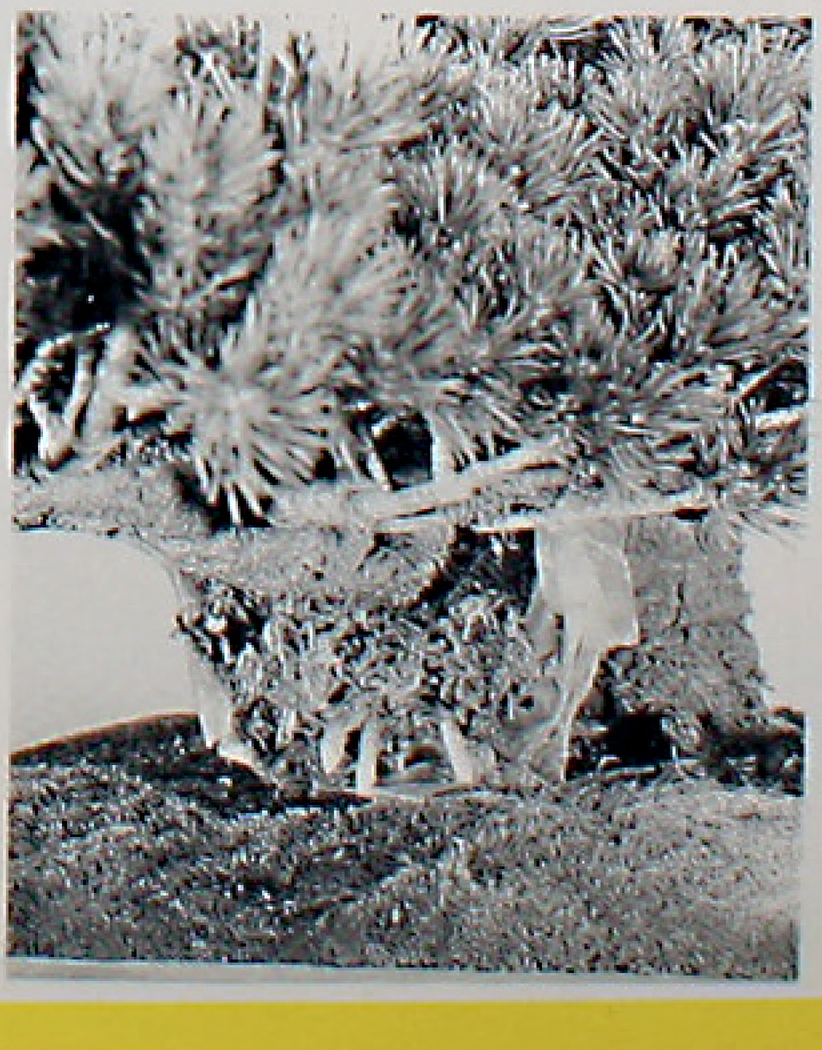


planted in a training pot. The tree was then defoliated, to make sure that the new roots would adapt to the new medium without needing to work excessively absorbing water, to replace evaporative loss from the leaves. The next year, the maple had produced more than enough roots to permit the first selective pruning and its definitive planting in a Bonsai container: a "new" bonsai maple was created.

1 After separation, the tree is completely defoliated to avoid excessive loss of moisture.
2 One year after transplanting, growth is considerable.
3 The arrow shows roots separated with a guy wire.
4 Cut the roots to leave a flat root ball.
5 The tree in its final Bonsai container.

The lower right branch is to be layered.

Layering wrapped in sphagnum.

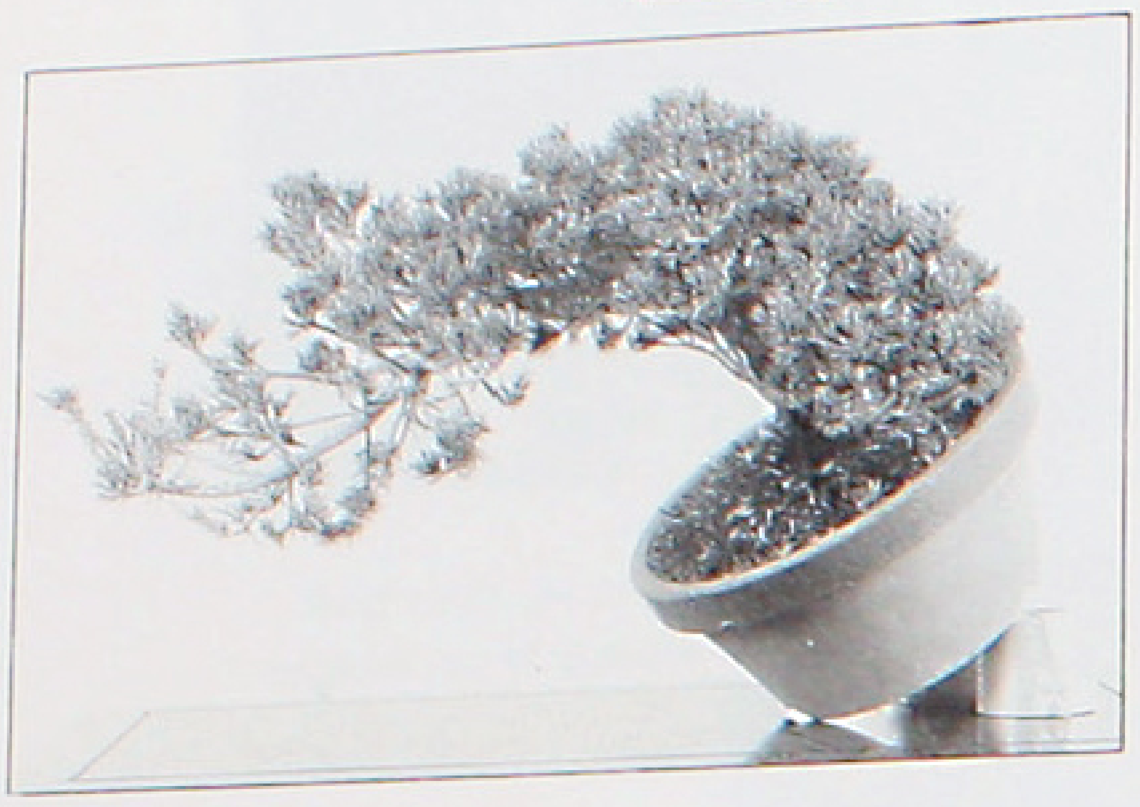


Layering a white pine

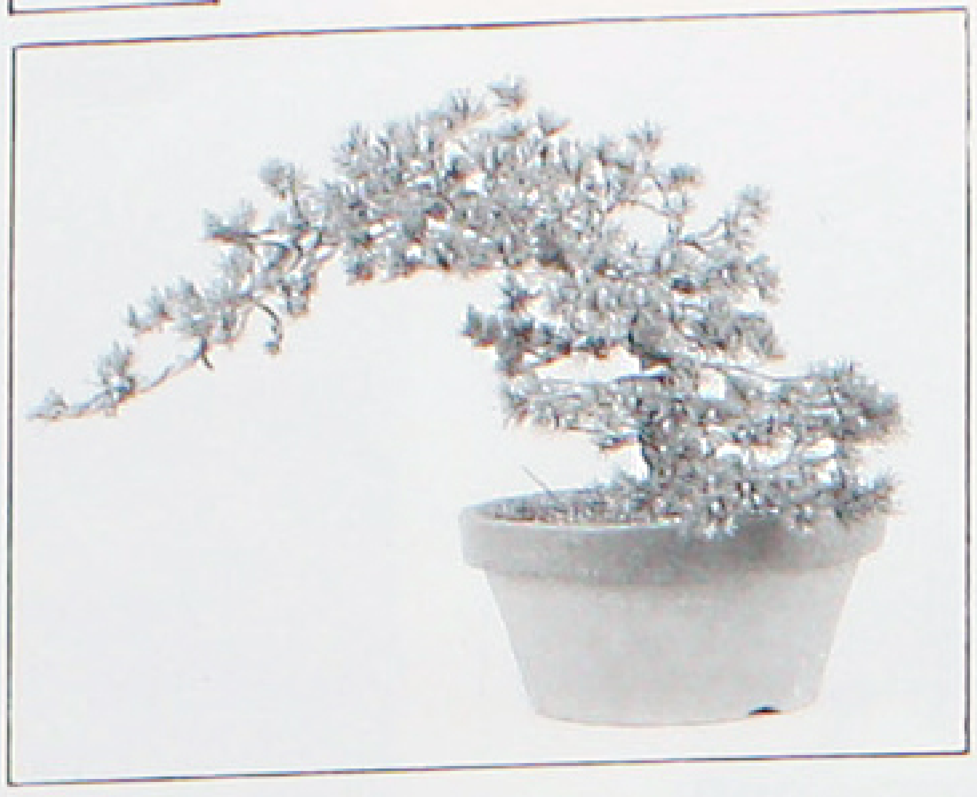
In this case, the layering was done on a formal upright pinus parviflora. It was layered because the dense growth made it impossible to see the base of the trunk. Instead of simply pruning the lower branches, it was decided to layer the lowest branch to try to create a new Bonsai. A ring of bark was peeled, but in this case, a plastic bag containing long fiber sphagnum moss was used with rooting hormones. It took longer to root (five years), but the results were just as successful.

TECHNIQUES OF PROPAGATION: AIR LAYERING

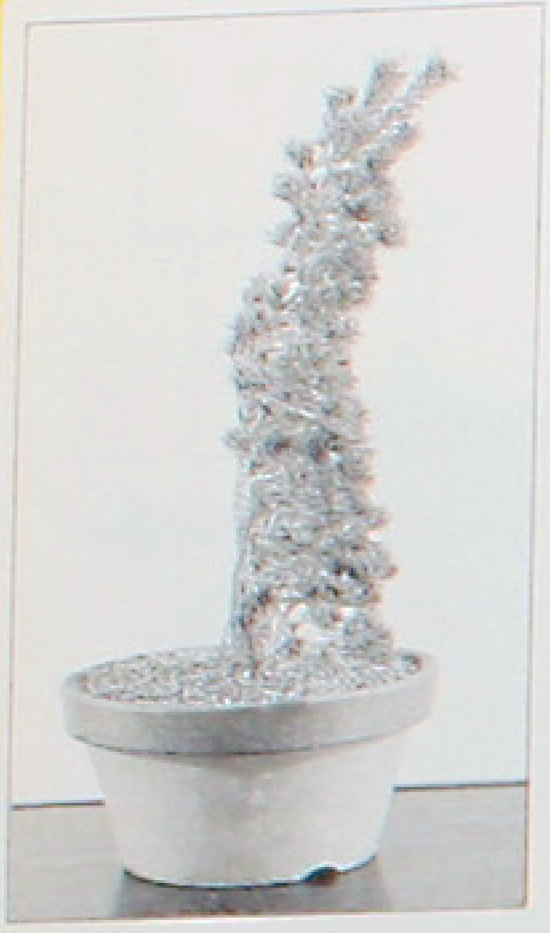
1980



1981



◄ With the help of a guy wire, it will be trained into a semi-cascade.

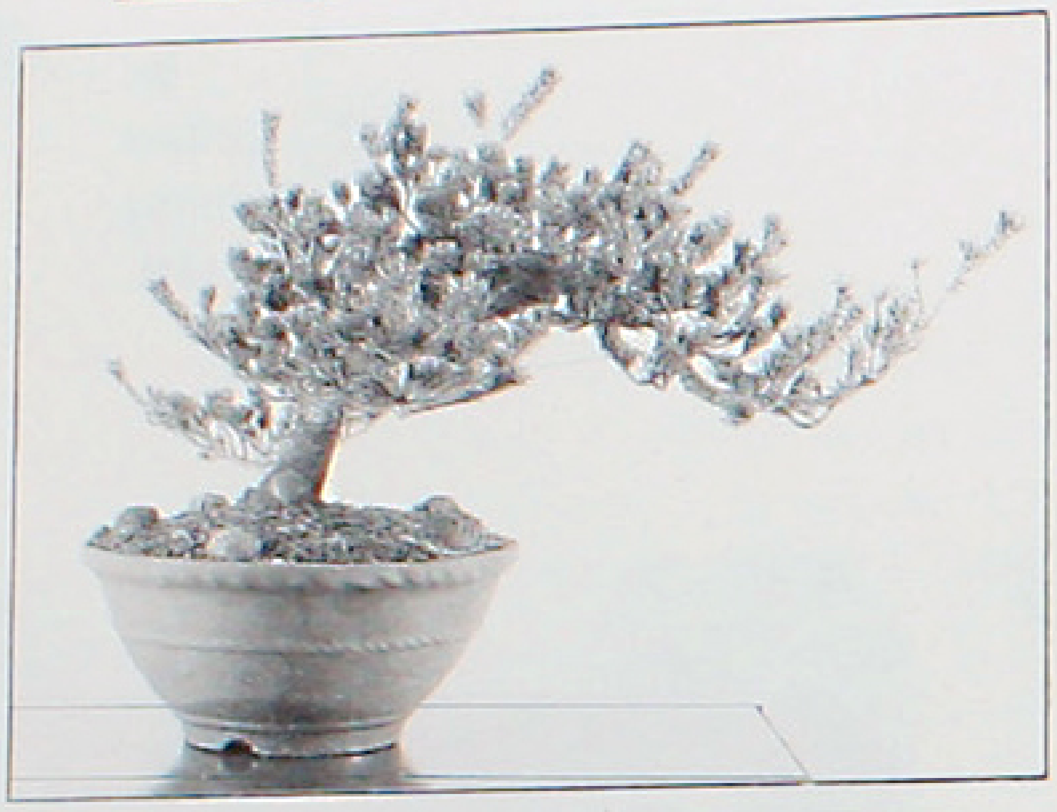


1979

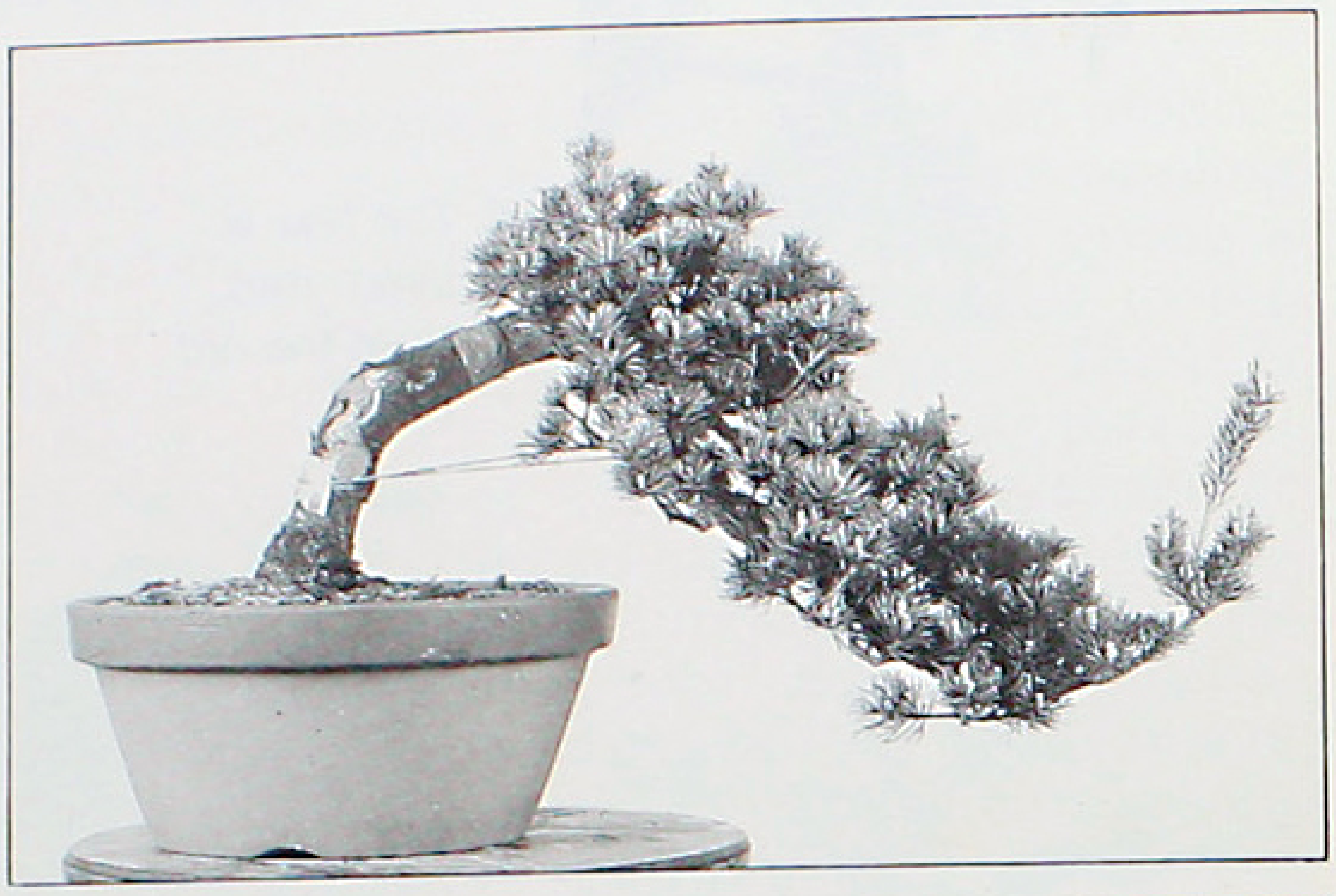
▲ The branch is planted in a training pot.

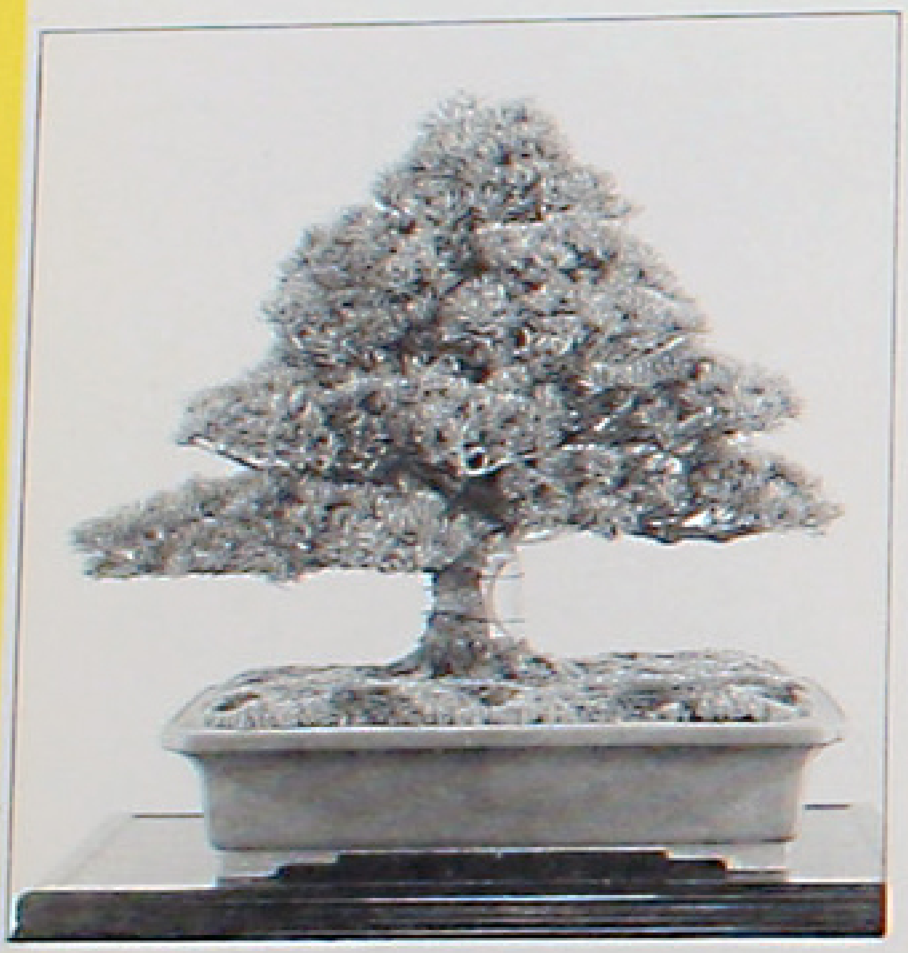
On the left, no major pruning or wiring has yet been done. On the right, the tree has been pruned and wired. ►

1982

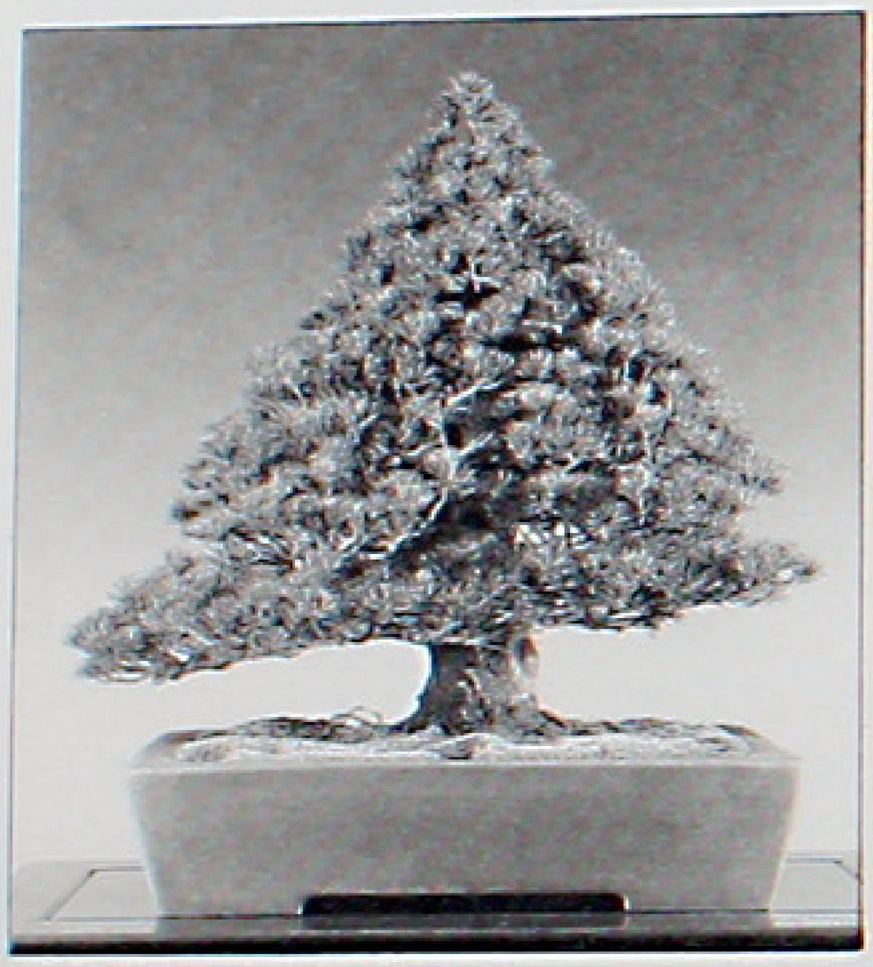


1987





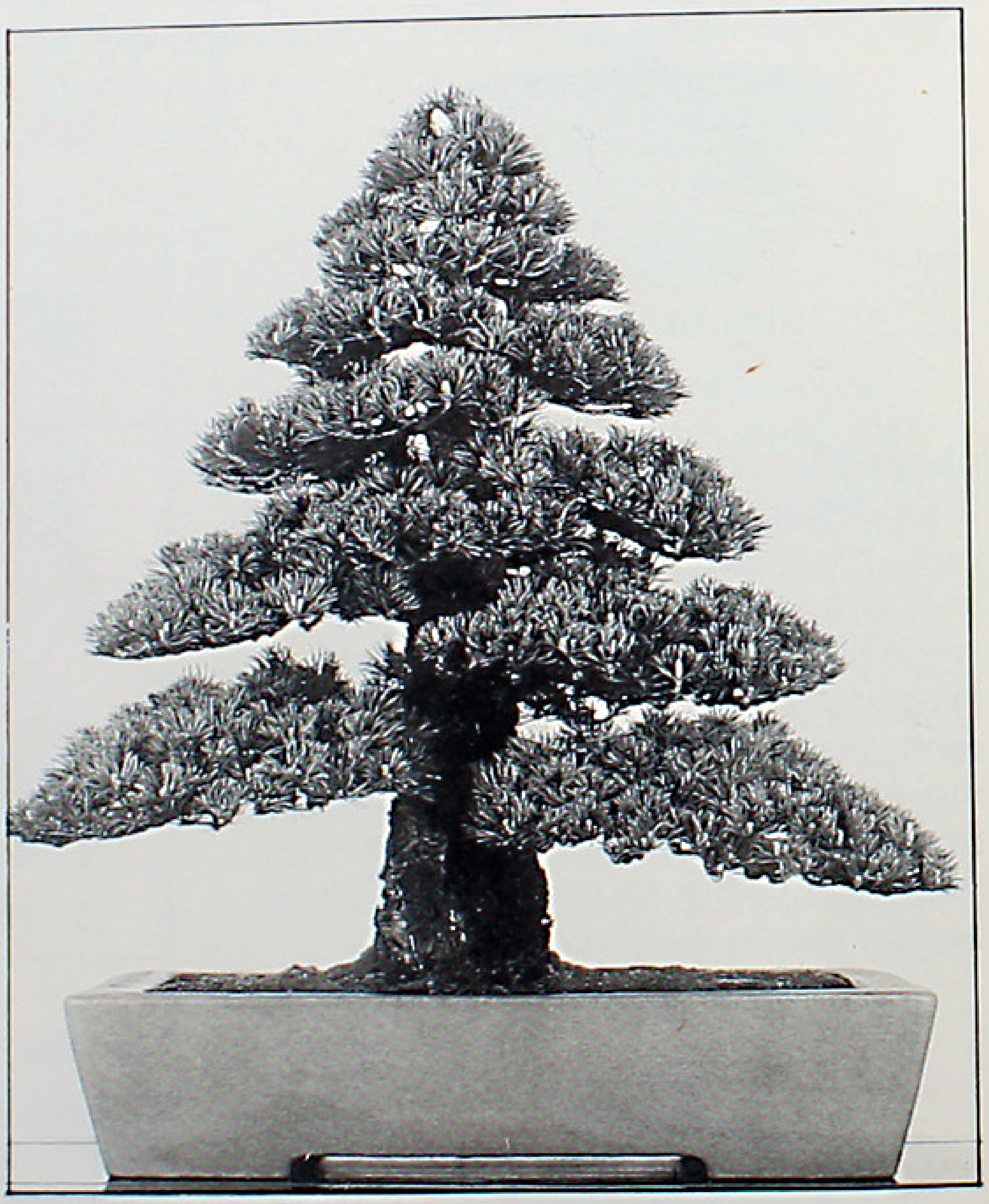
1979

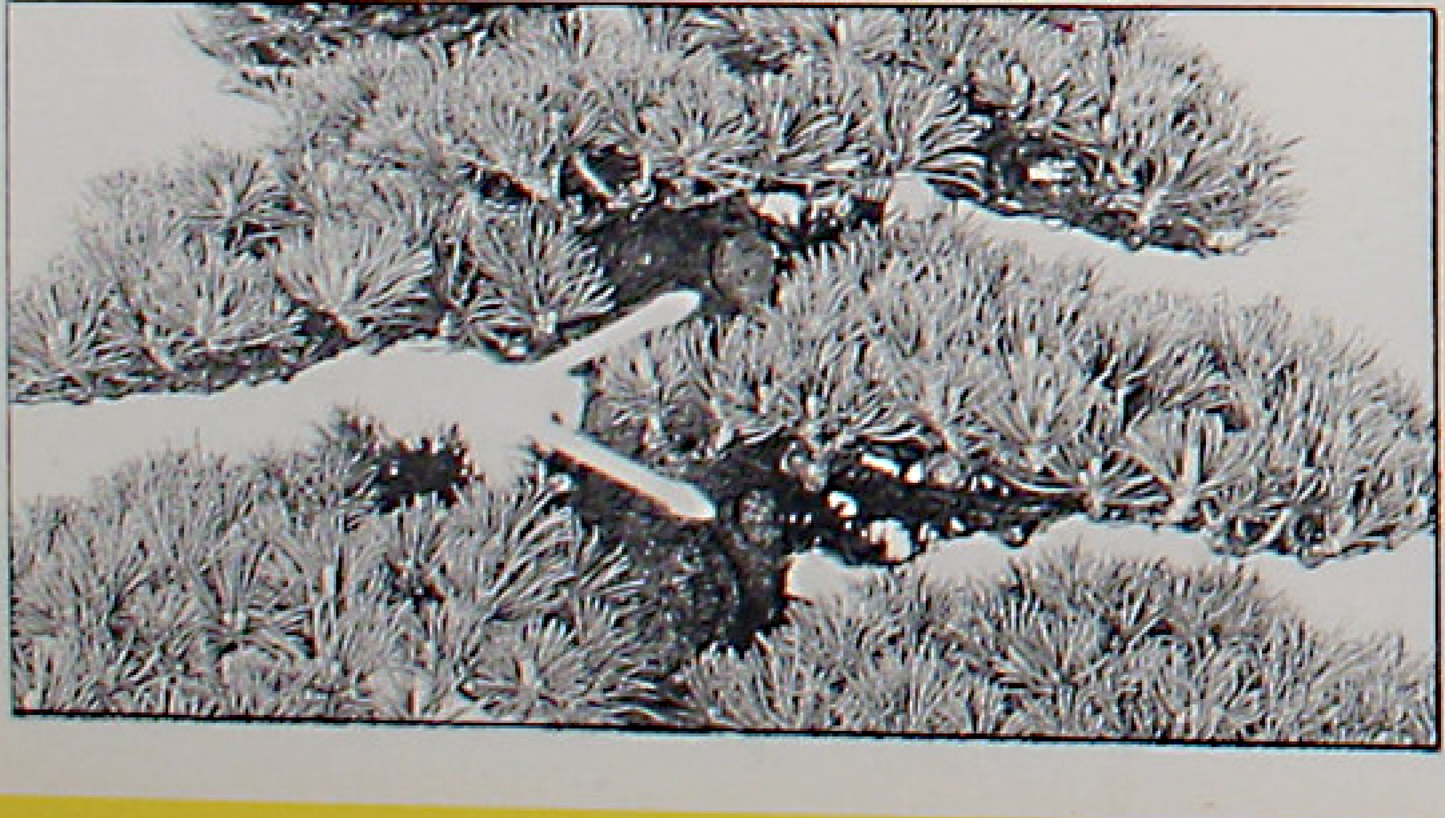


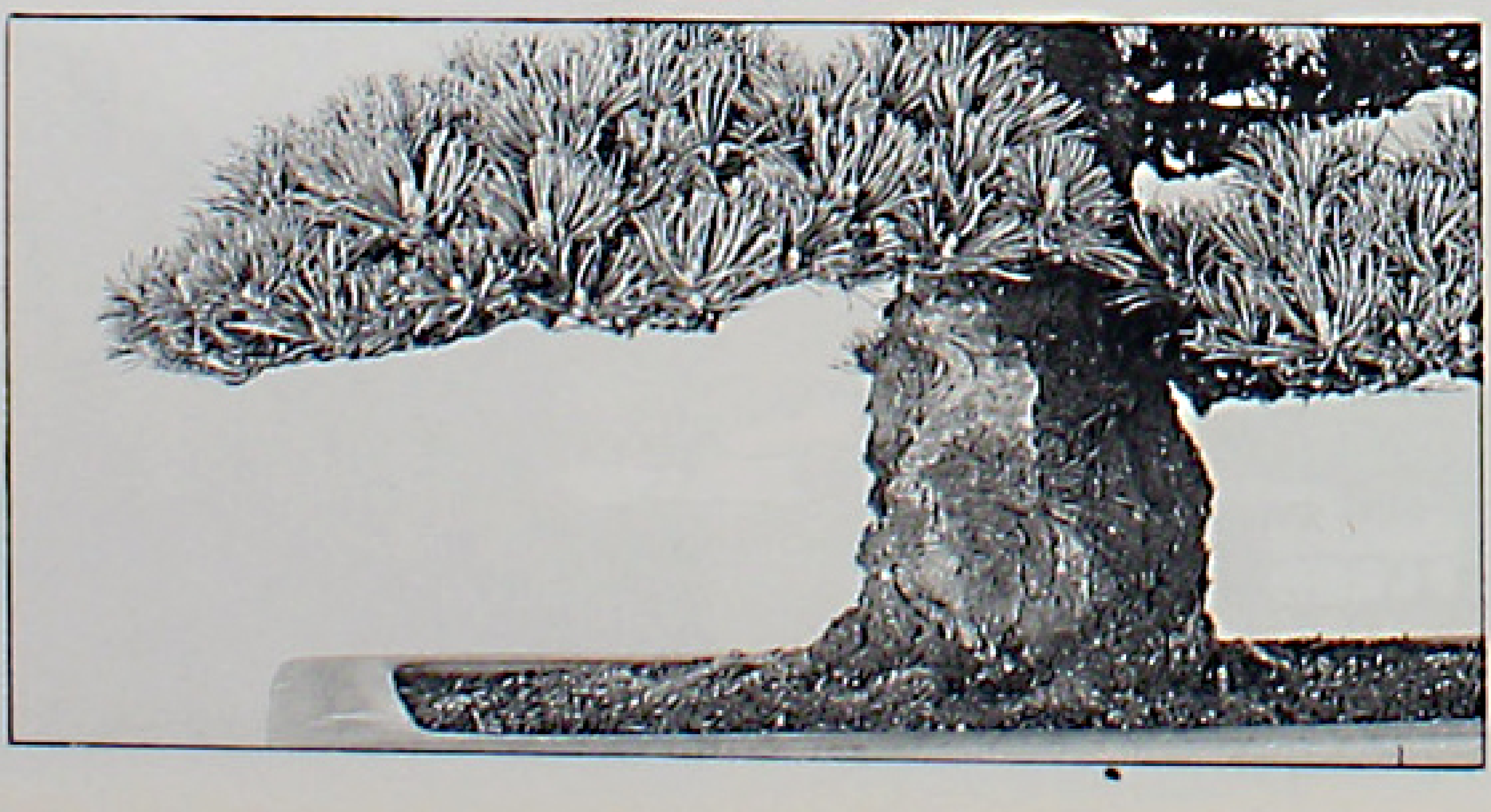
1982

In this series of photographs, one can see the change in the "mother" tree after removing the lower branch. In the 1987 illustration, the old back became the front. The improvement in the design accomplished by pinching and branch pruning is quite evident.

1987







◄ Left: Separate masses of foliage. Right: the old scar.

JUNIPERUS RIGIDA

Designing and shaping a needle juniper

Author: KIHARA SUSUMU

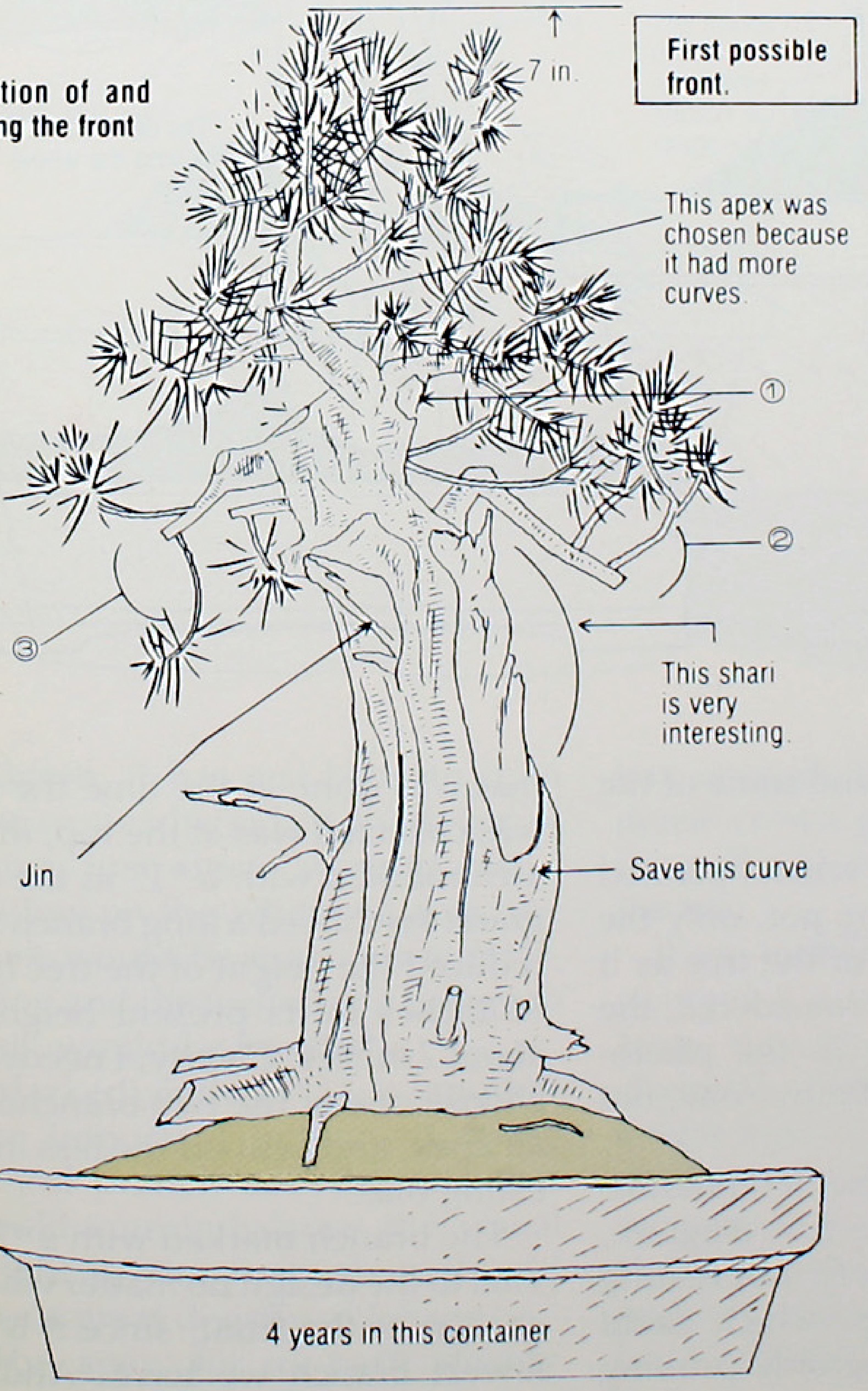
The styling of a collected needle juniper, juniperus rigida, is described in this article.

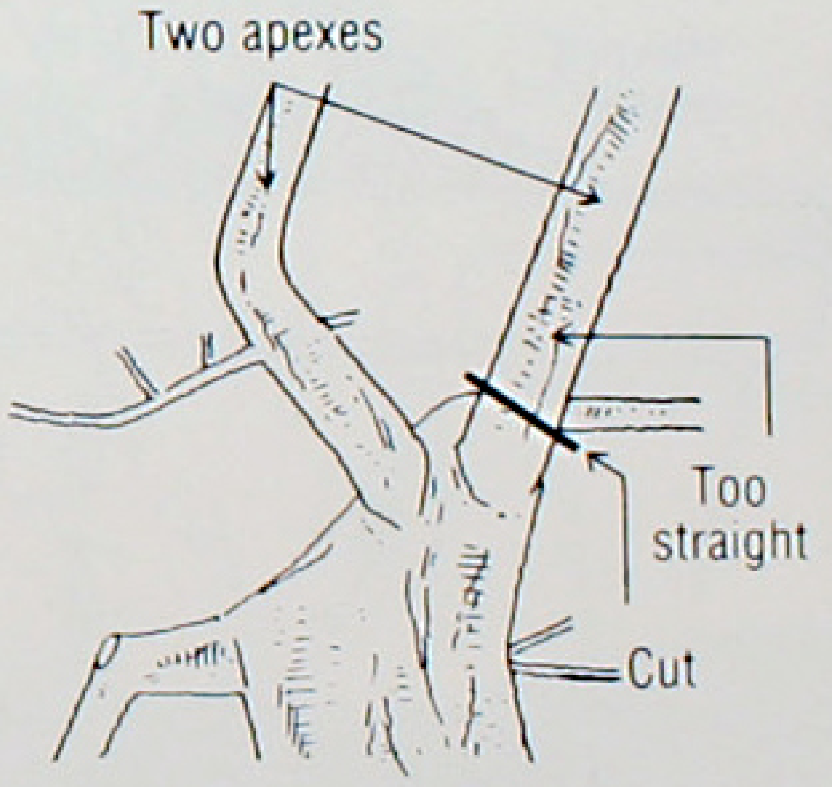
The author provides insight into the design process, that artistic evaluation that occurs as the design evolves in one's mind, even before the tree is touched. The juniper is considered from each of four different directions and the design possibilities suggested or dictated by the basic form and character of the tree, as viewed from that particular direction, are explored.

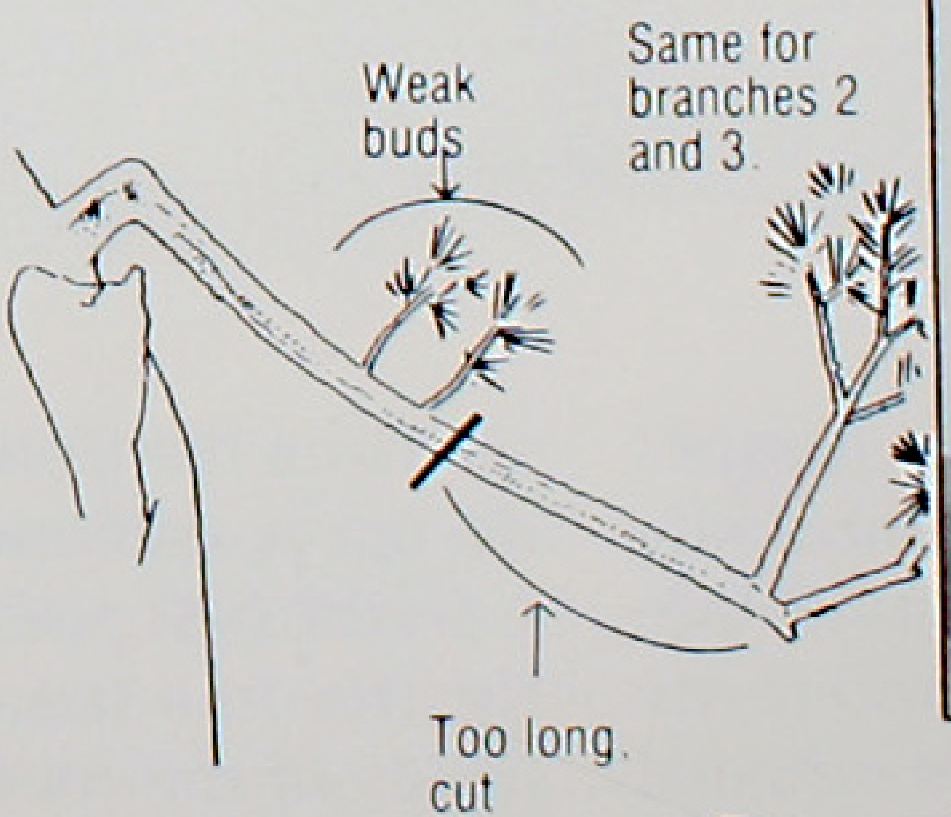
Although the subject of this article is a collected needle juniper, the techniques employed may be applied to any collected juniper, or, for that matter to juniper nursery stock. Collected trees often have existing dead wood or unwanted branches that can be converted into dead wood areas that enhance the basic design. Mature or overgrown nursery stock presents similar possibilities.

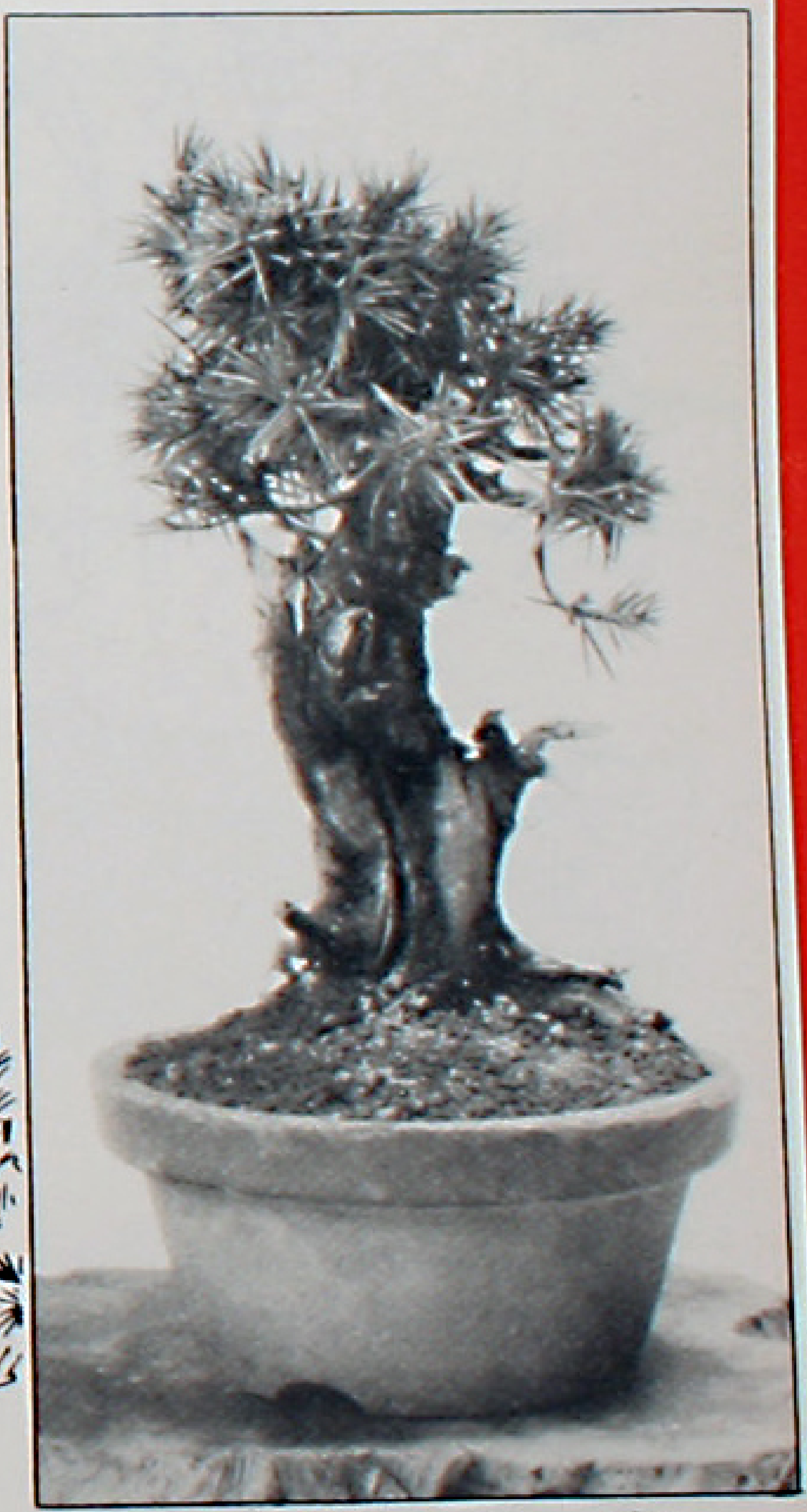
There are many collectable junipers in North America, including the California juniper (j. californica), the common juniper (juniperus communis), the Rocky Mountain juniper (j. scopulorum) and the creeping juniper (j. horizontalis). Readily available in most nurseries are the many cultivars of the Chinese juniper (j. chinensis), including San Jose, shimpaku, etc. as well as the ever present Japanese dwarf ground juniper (j. procumbens nana).

Selection of and shaping the front

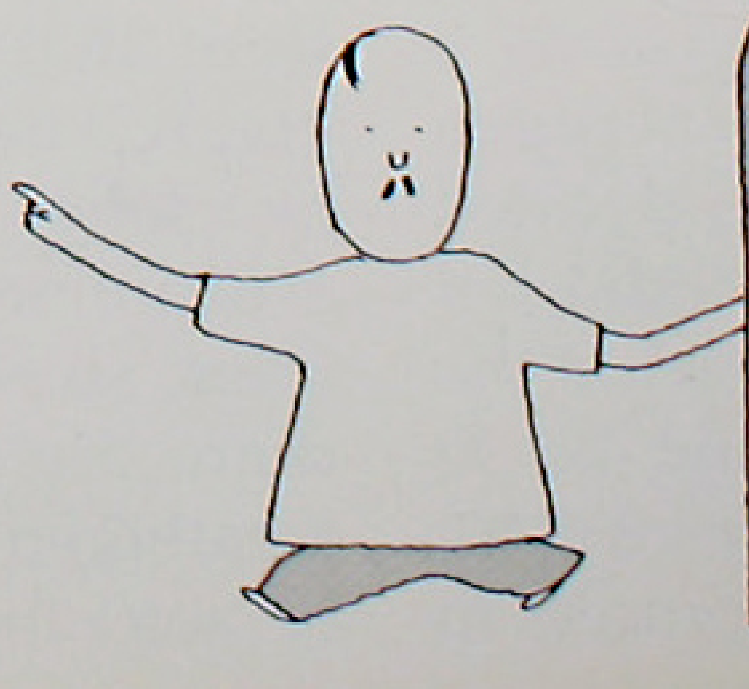

7 in.
First possible front.
This apex was chosen because it had more curves.
①
②
③
This shari is very interesting.
Jin
Save this curve
4 years in this container



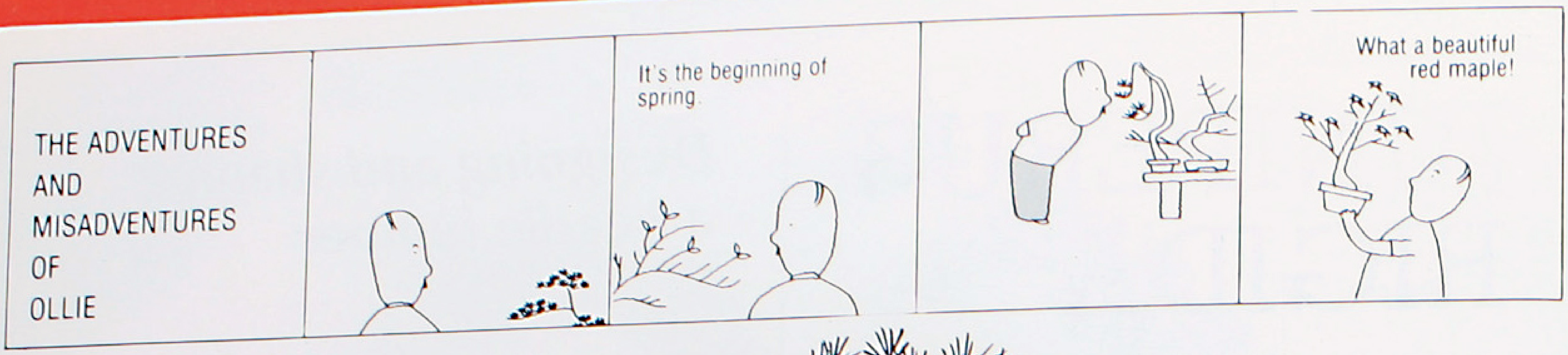


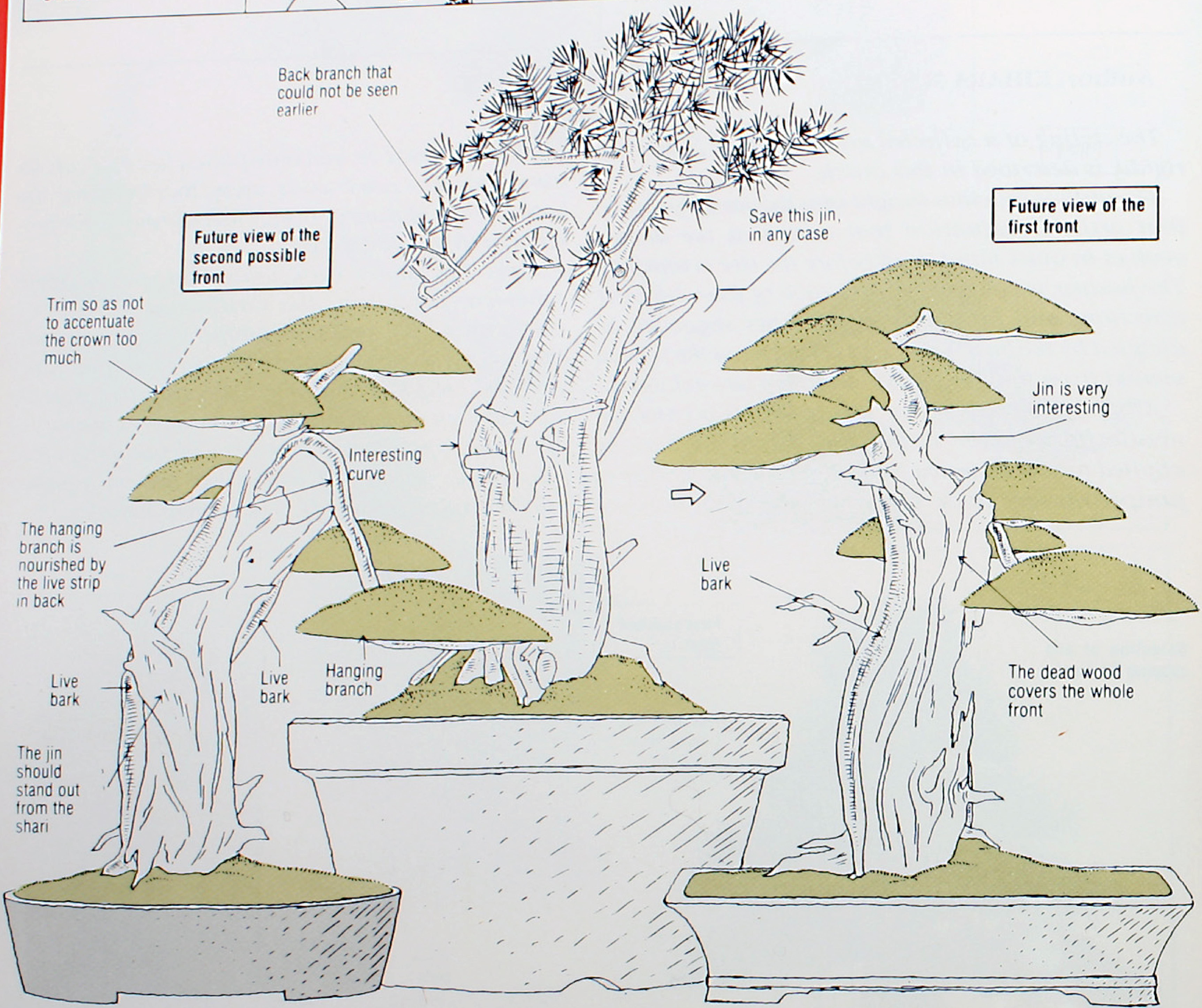


Photograph of the tree before shaping



This juniper was collected from nature 4 years ago. At that time, it was 16 inches high, and by removing the old apex it was reduced to 7 inches.


THE ADVENTURES AND MISADVENTURES OF OLLIE
It's the beginning of spring.
What a beautiful red maple!

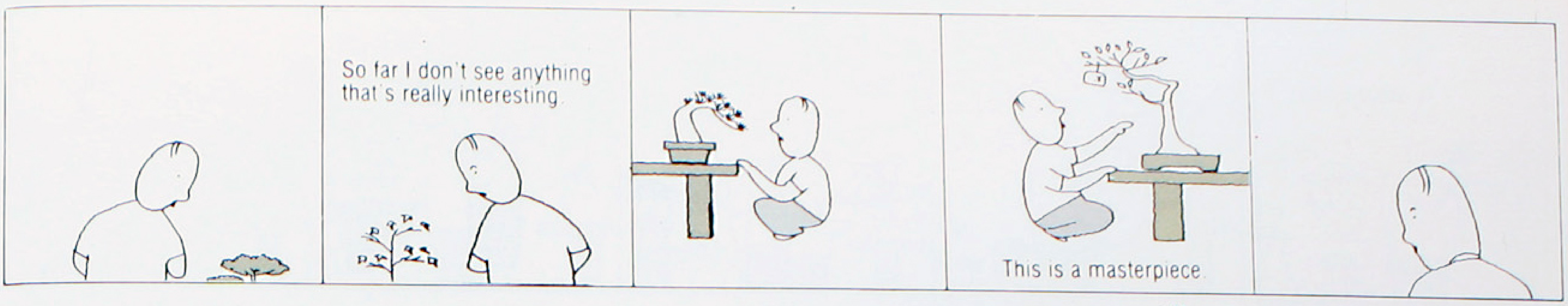

Back branch that could not be seen earlier
Save this jin, in any case
Future view of the second possible front
Future view of the first front
Trim so as not to accentuate the crown too much
Jin is very interesting
Interesting curve
The hanging branch is nourished by the live strip in back
Live bark
Live bark
Live bark
Hanging branch
The dead wood covers the whole front
The jin should stand out from the shari

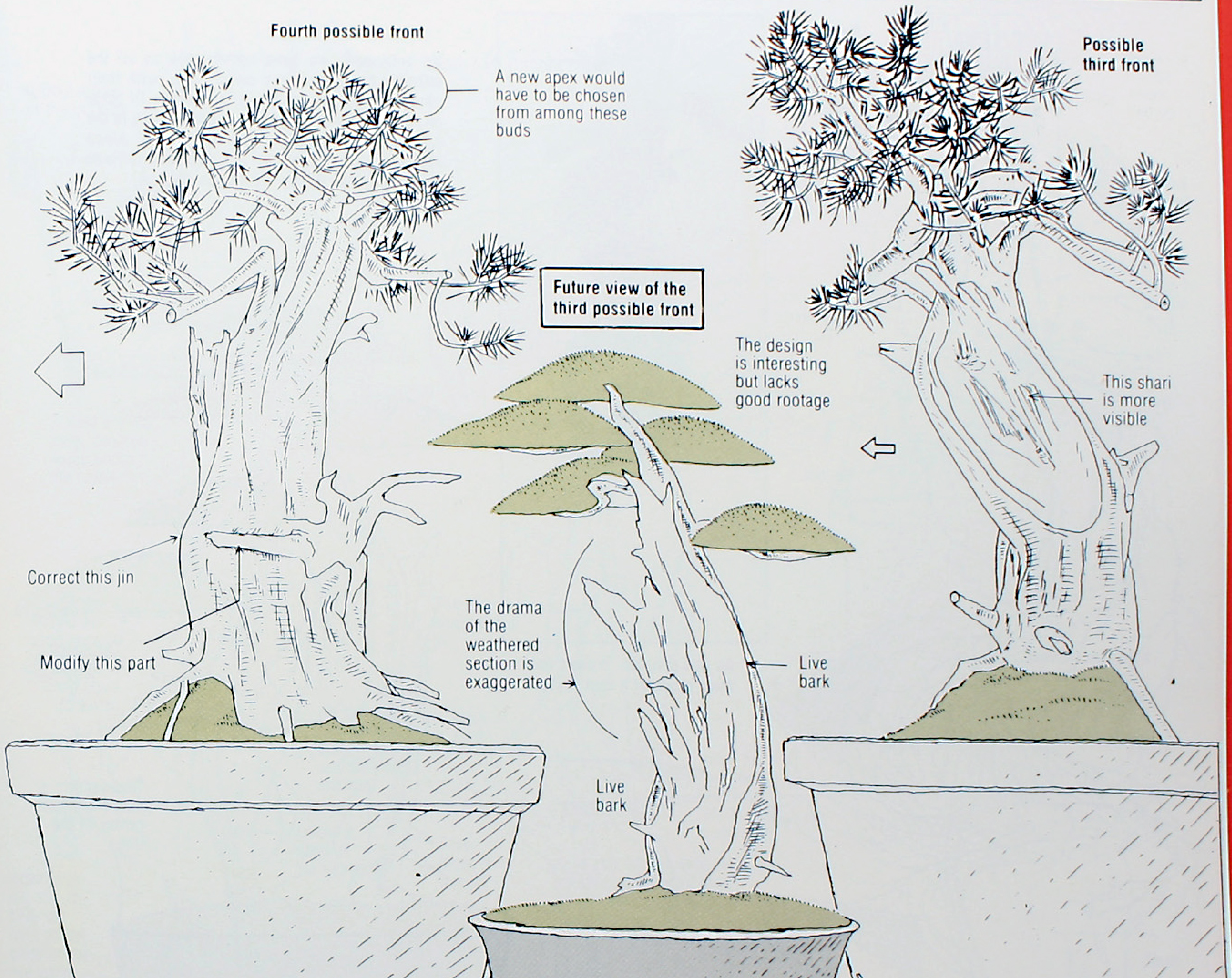
When I collected this juniper four years ago, I didn't anticipate the design problems I would face when it was established and ready to be styled. In Japan, it is unusual to find a needle juniper growing on a mountain that is useful as a Bonsai, so, although this specimen was not very attractive, I decided to collect it. At that time I did not imagine that the work with the weathered sections would be so complicated. In this article I will try to explain my reasoning process in selecting the front and some of the design possibilities.

In the first place, when I planted the tree in a training pot, only the needs of the roots of the tree as it was collected were considered; the front that appears in the photograph is not the definitive one, not by a long shot.

Beginning with the first possible front, shown in the first diagram, there are some very interesting weathered sections, which could be accentuated. The only pruning that was done at the time the tree was collected was at the top, in the area marked with a "1" in the diagram. I removed a long branch that reduced the height of the tree from 16 inches to its present height of about 7 inches. Clearly, I needed to choose one of the two branches as an apex, and I cut off the less interesting one.

The branch marked with a "2" is vital to the design no matter what is chosen as the front, since it is the lowest branch we have. And, in


So far I don't see anything that's really interesting.
This is a masterpiece.


Fourth possible front
A new apex would have to be chosen from among these buds
Possible third front
Future view of the third possible front
The design is interesting but lacks good rootage
This shari is more visible
Correct this jin
Modify this part
The drama of the weathered section is exaggerated
Live bark
Live bark

addition, it has just beneath it an area of deadwood; if the layer of foliage just above were to cast a shadow on the whitened area, the trunk would be much more interesting and the feeling of it being too "flat" would be avoided.

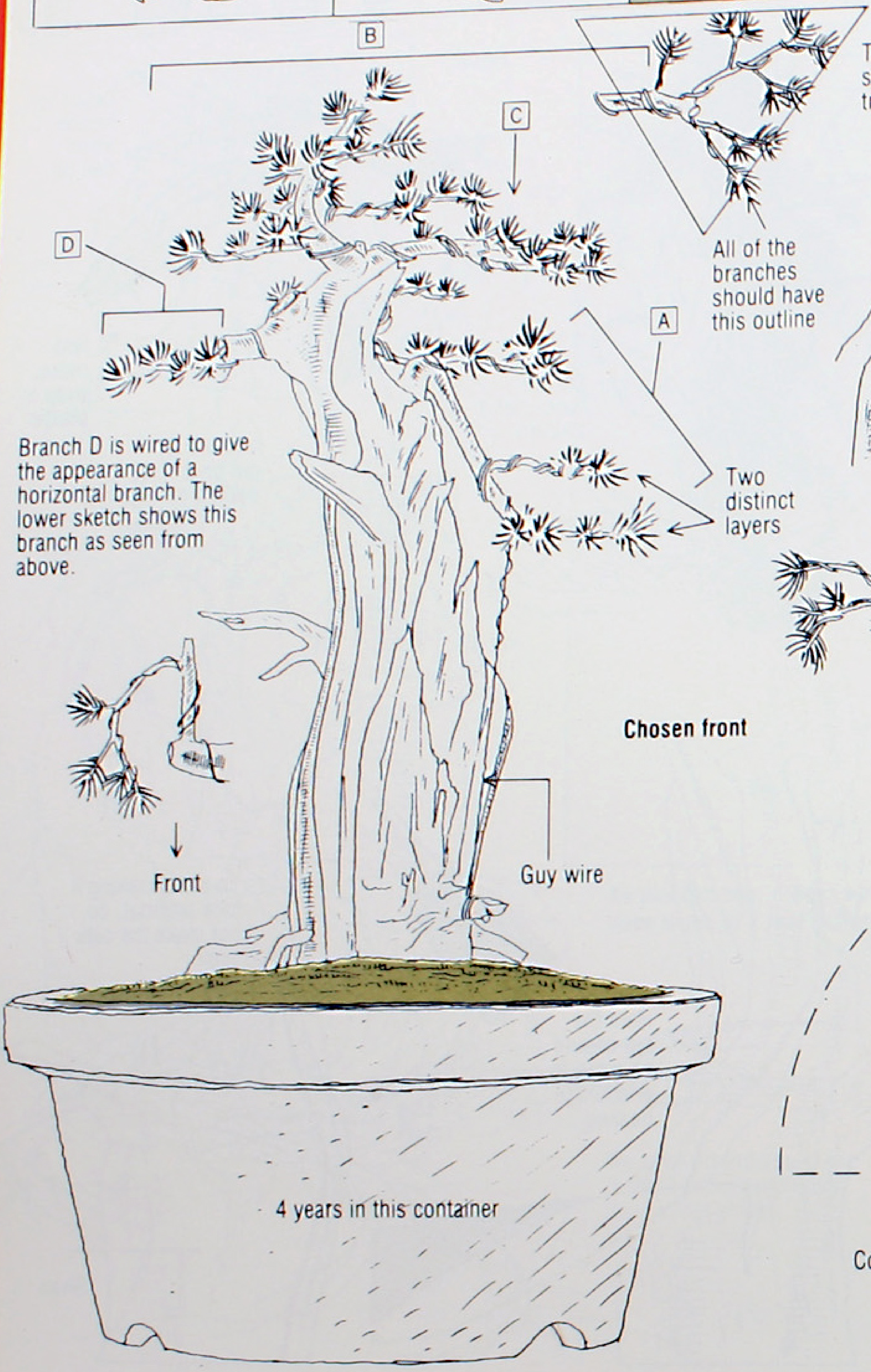
Marked with a "3" is another very important branch. It is the second branch and the one that should counterbalance the visual weight of the first, so it should have a great density of foliage.

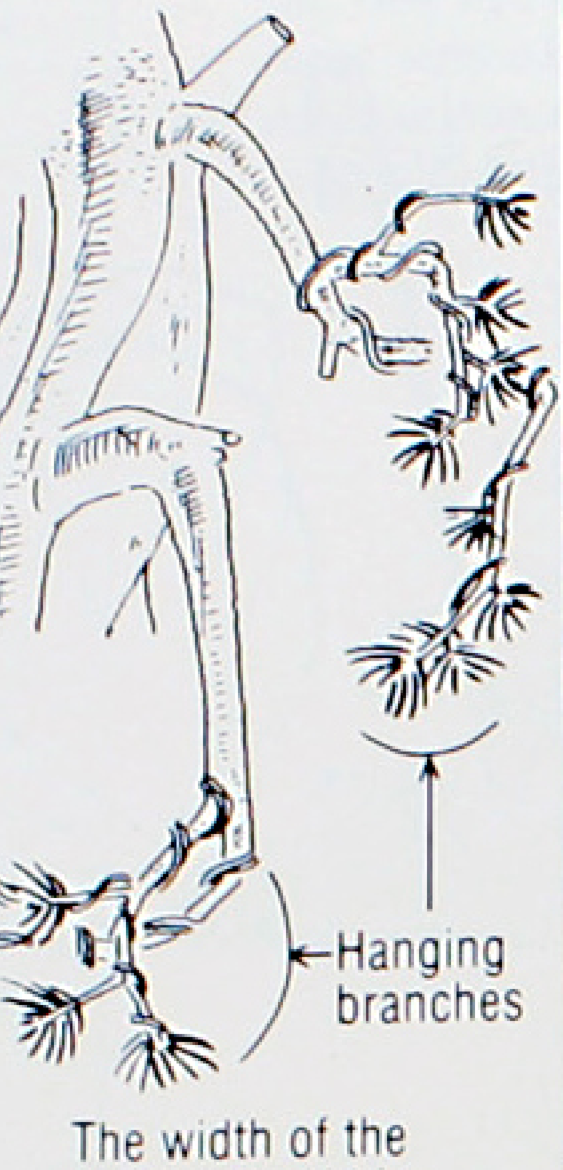
The apex, for its part, already has enough branches to form a dense crown in a short time, and this will add depth and stability to the tree.

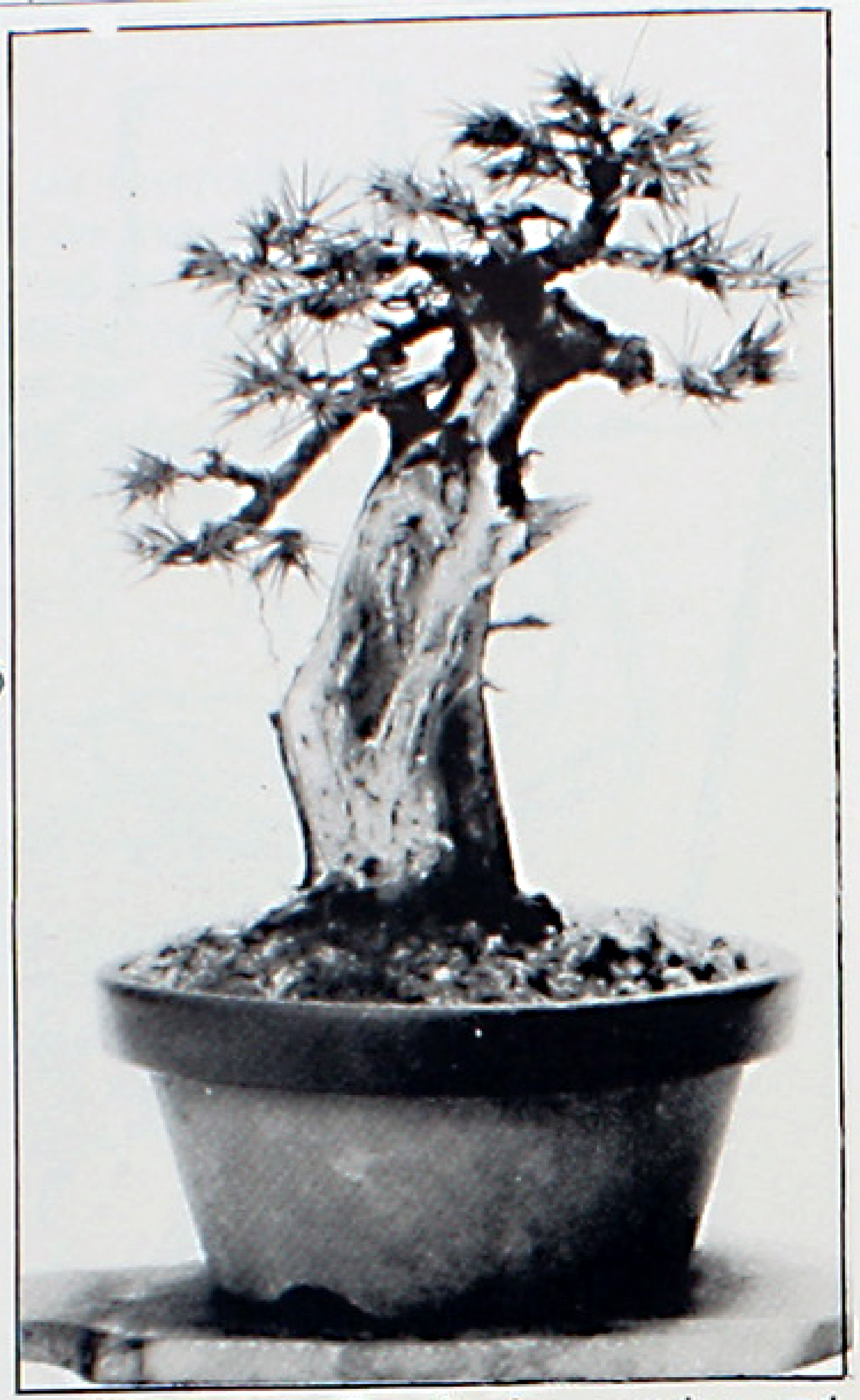
If we turn the tree to the right, we find a second possible front. Note that the conditions have changed completely and we no longer have an upright tree but a slanting one, with a strong visual movement to the right. Slanting styles always present the same problem: that of deciding whether to accentuate the slant or to try to balance it. In this case the choice is not so difficult, since the first branch opposite to the inclination of the trunk is so very high that we are unable to compensate for the slant. We can only accentuate it by training the right hand branch into a hanging one, creating various masses of green all along its fall. At the same time this reduces the distance between the base of the trunk and the first branch.

Another problem we find in the case of this front is that we have a

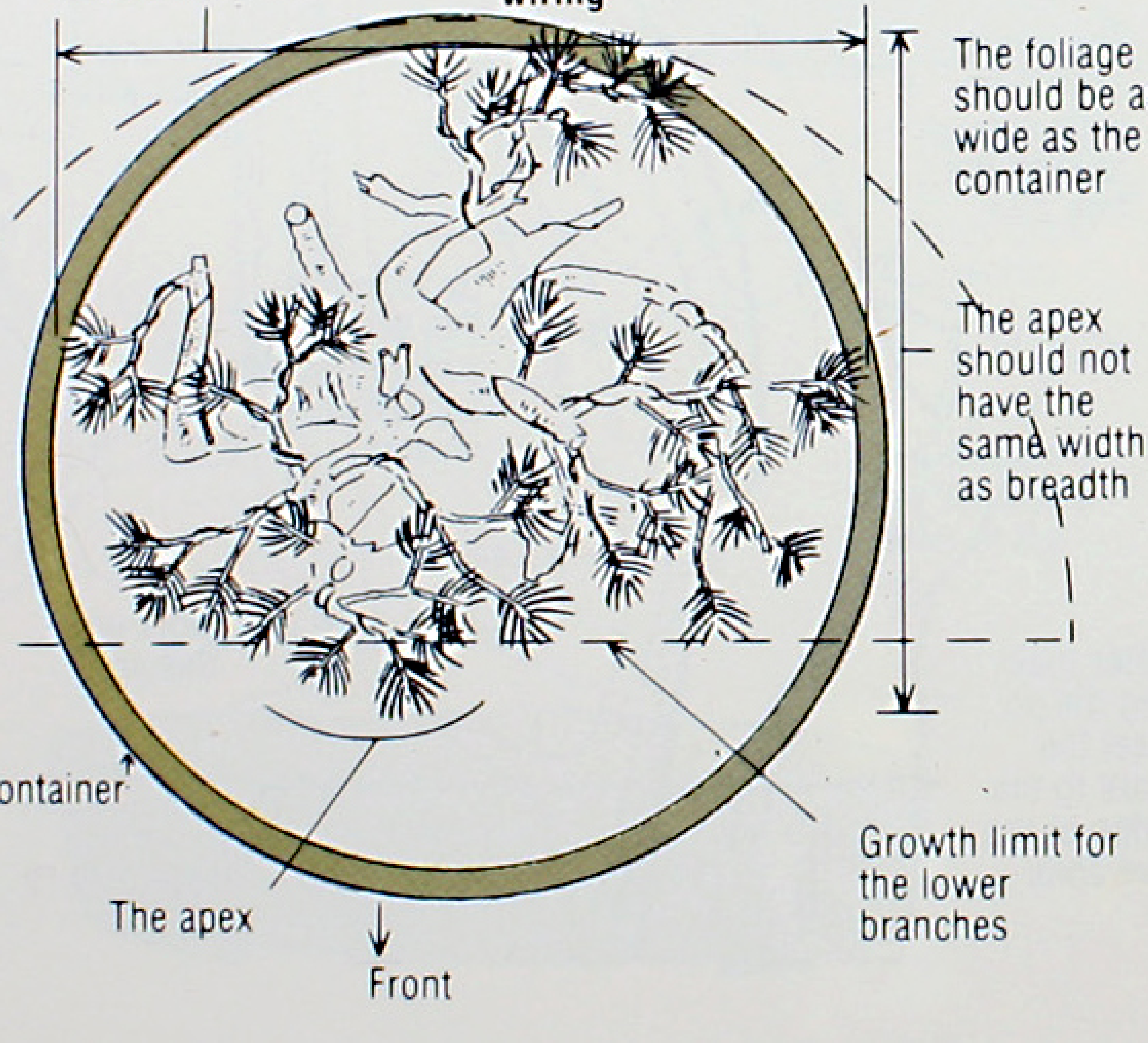
But which should I choose?
75.00 x 2
Spoilsport.


B
C
D
A
The foliage should have a triangular shape
All of the branches should have this outline
Branch D is wired to give the appearance of a horizontal branch. The lower sketch shows this branch as seen from above.
Two distinct layers
Front
Chosen front
Guy wire
4 years in this container





Appearance after shaping, pruning, and wiring


The width of the foliage should be greater, as shown by the dotted lines.
The foliage should be as wide as the container
The apex should not have the same width as breadth
Container
The apex
Front
Growth limit for the lower branches

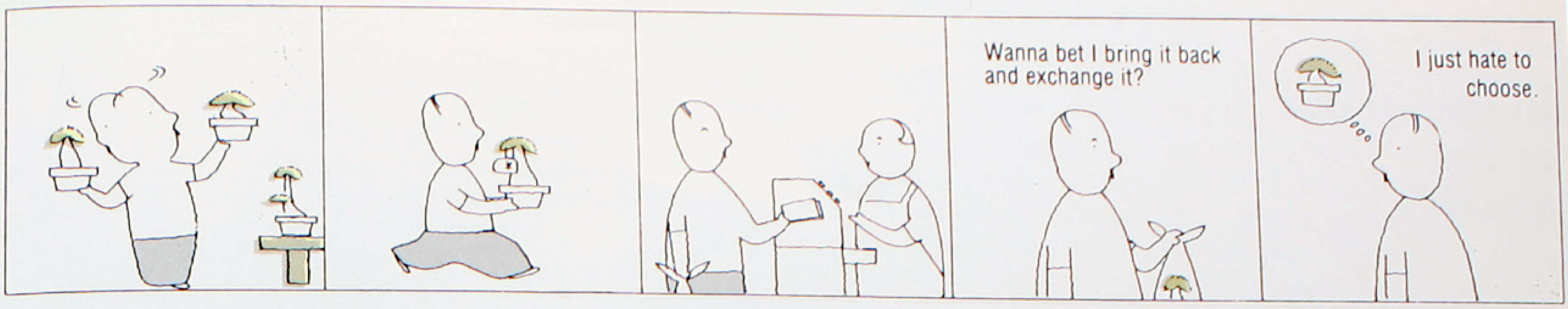
trast on the opposite side of the tree, but not much can be done with the live section of bark.

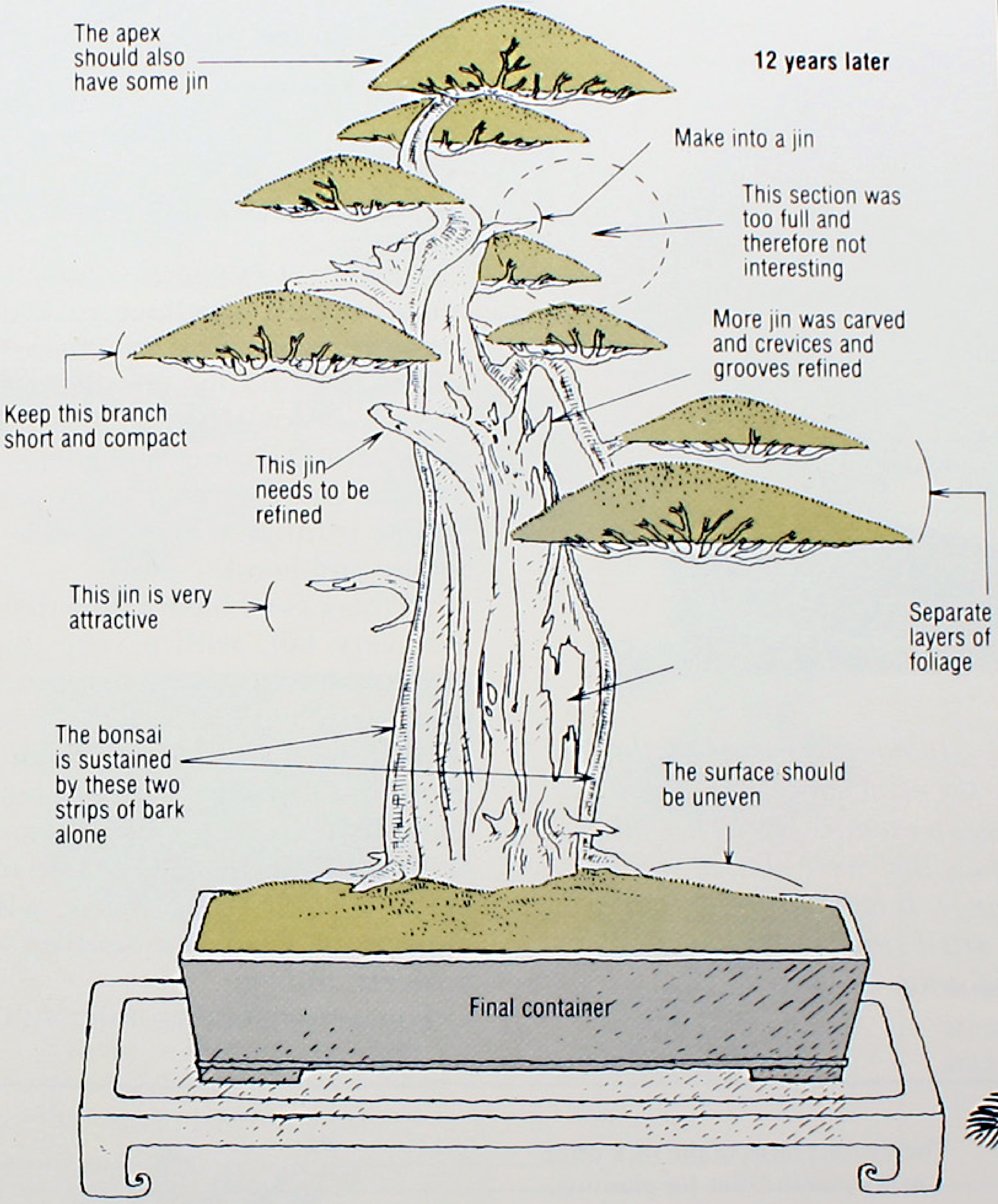
Another approach is to bring a branch down just over the jin. The shadow it produces, together with the contrast between the white of the bare zone and the green of the foliage, will convert it into the visual center of the tree, drawing attention away from the trunk to the area between the jin and the hanging branch.

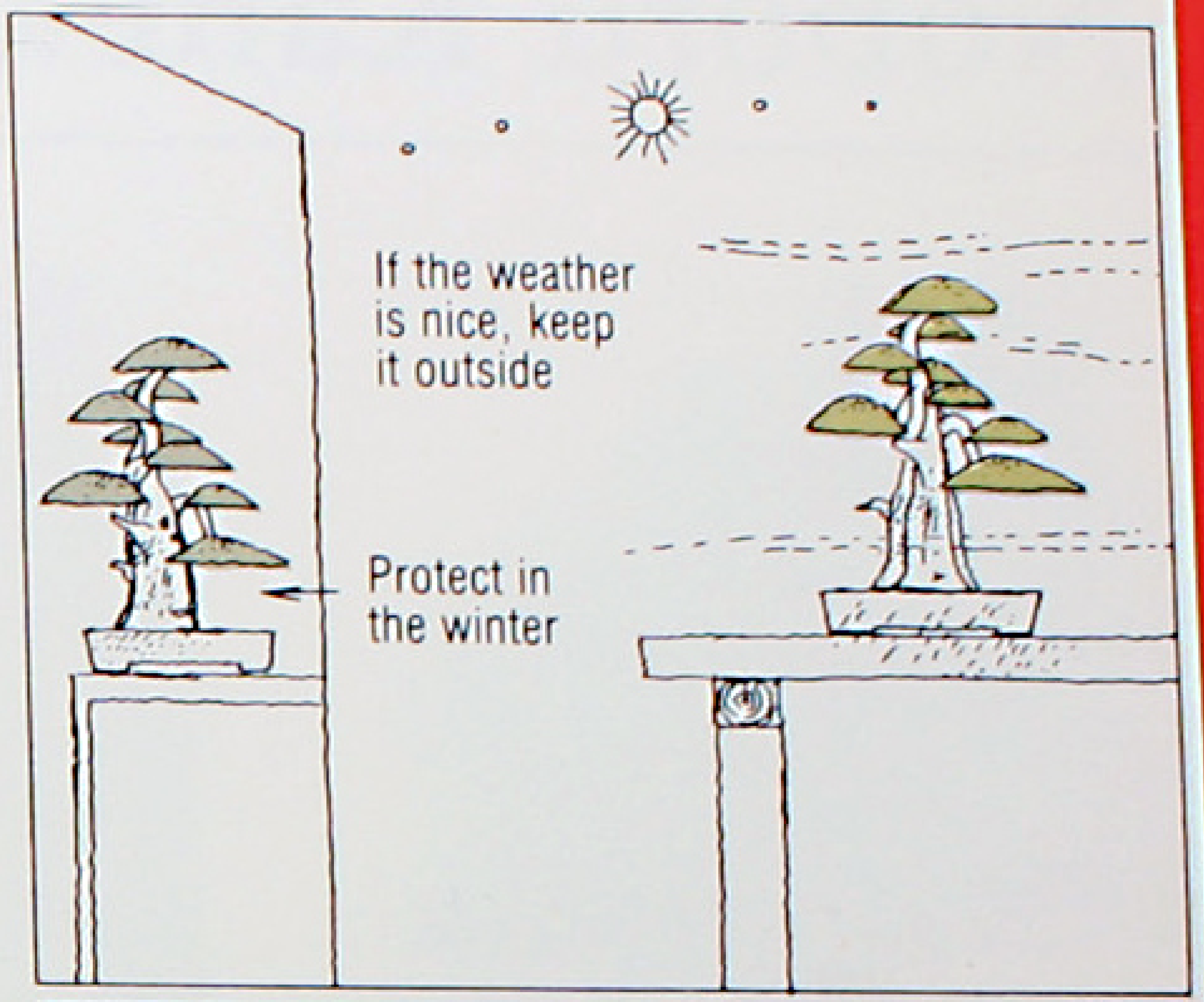
Before selecting the final front, there is still another constraint that must be evaluated; that is, what will the roots permit. All of the solutions feature a large amount of deadwood. Strips of living bark are left intact, through which the tree will nourish itself; therefore, the strips of bark should have at their base a sufficient number of roots to keep the tree alive. And there is only one way of seeing if this is possible or not: by cleaning the soil off the roots.

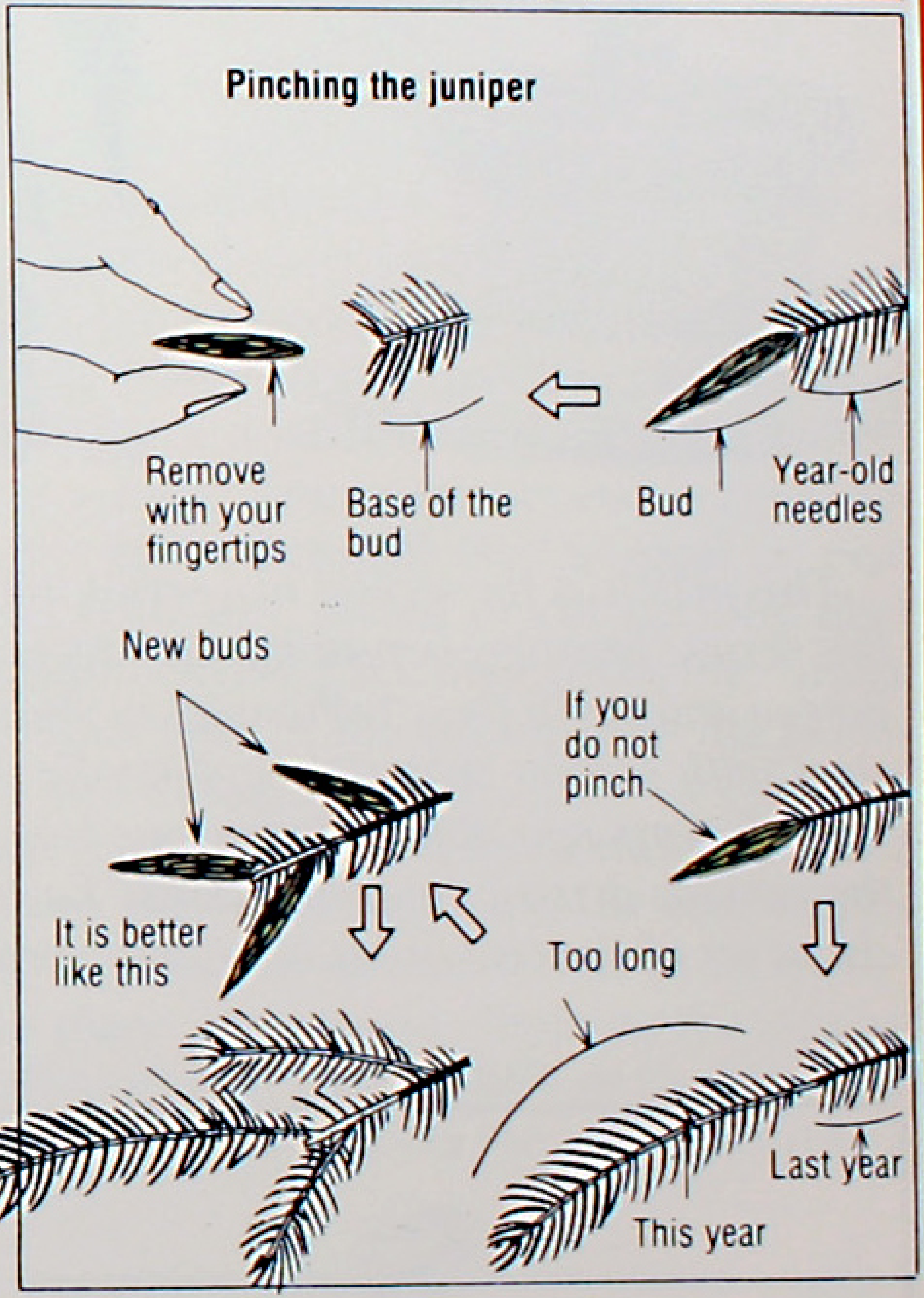
In order not to damage the fine roots when removing the soil, do not use a stick or a rake, since in combing the soil some of the fine roots may be pulled out; instead, submerge the tree in water and clean the soil off the roots by hand. Once the roots are free of soil, untangle them and cut just the tips of the longest ones, without touching the finer, weaker roots.

The reason for not cutting more roots is that this tree is soon going to have its bark peeled and be pruned, wired and transplanted.


Wanna bet I bring it back and exchange it?
I just hate to choose.


12 years later
The apex should also have some jin
Make into a jin
This section was too full and therefore not interesting
More jin was carved and crevices and grooves refined
Keep this branch short and compact
This jin needs to be refined
This jin is very attractive
Separate layers of foliage
The bonsai is sustained by these two strips of bark alone
The surface should be uneven
Final container


If the weather is nice, keep it outside
Protect in the winter


Pinching the juniper

The accumulated risks are sufficient without adding more by pruning the roots. As you can imagine, the tree was fertilized abundantly the previous season and allowed to grow freely so that it could face the design session in the best possible health.

After the roots have been pruned, wrap the root ball with damp moss and tie it in a plastic bag to keep the roots from drying out while the tree is being styled. It is easier to handle, and safer for the roots, to proceed in this way rather than by peeling the bark sections with the tree in a container.

The first step consists of refining the jin and shari, perfecting those it already had or creating new ones with the help of a chisel.

Once the jin are finished, mark the area of live bark with a grafting knife and peel the rest of the trunk. Then add detail to the trunk with crevices, grooves and cavities. Remove wood from places where it is convenient to add a curve: do some sculpting.

Within four or five years after major styling, the bonsai will be sufficiently refined to be able to decide on the definitive container best suited to the tree's design. The final diagram shows the tree in a container with straight lines, unglazed, in order not to distract from the most important feature of the tree: the weathered sections.

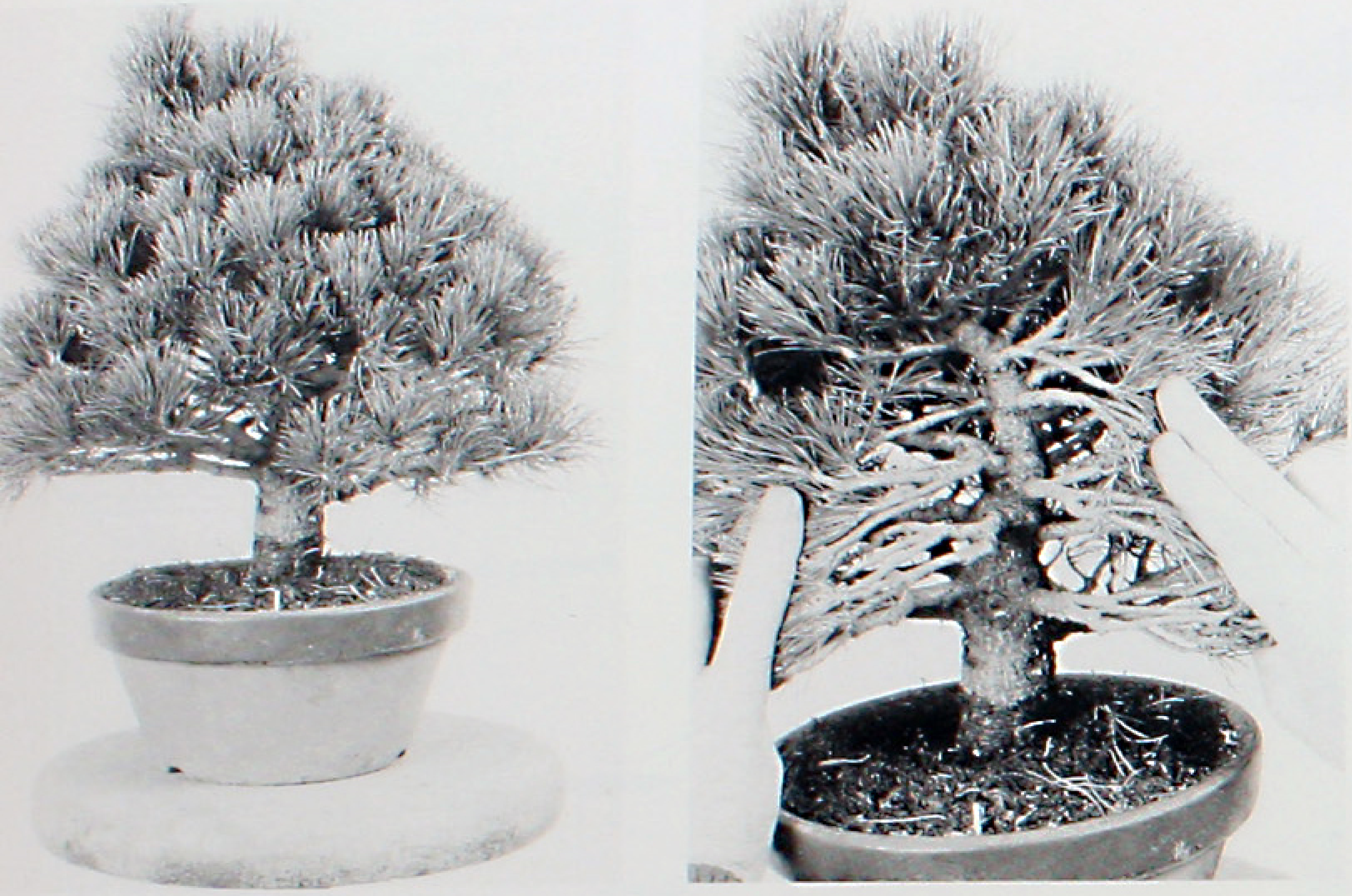
You can see that I selected the first alternative as the best design solution.

In the studio of the masters

Noboru Kaneko

Noboru Kaneko has been a professional grower of bonsai in Japan for more than 25 years.

In these illustrations, the initial dense branching can be seen.

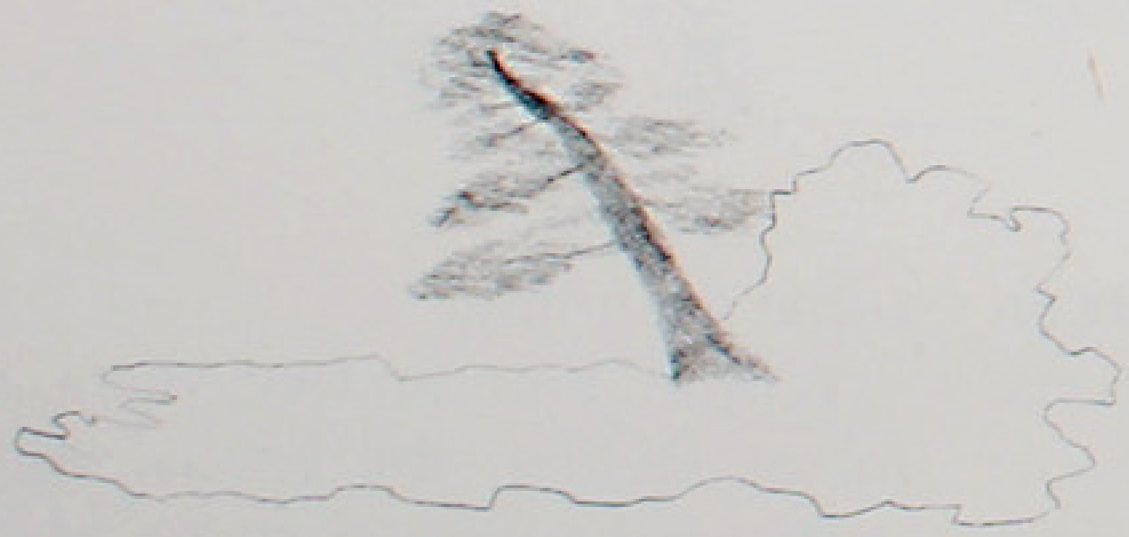


This article is the second in a series in the studios of the masters. In this series, Japanese bonsai masters review the principal techniques of Bonsai and apply these techniques in styling an example tree. They all start with similar material (five-needle pines that were started from seed 15 years ago, without previous training). It is interesting to see the various artistic interpretations. Each artist emphasizes the basic character of the tree in his own very special way.

At first, it is vital to study the material with which we are about to work, observing the character of the tree and the possibilities it possesses for shaping. A young pine, flexible and malleable, is not the same as an ancient pine, with a trunk that is impossible to shape and bend.

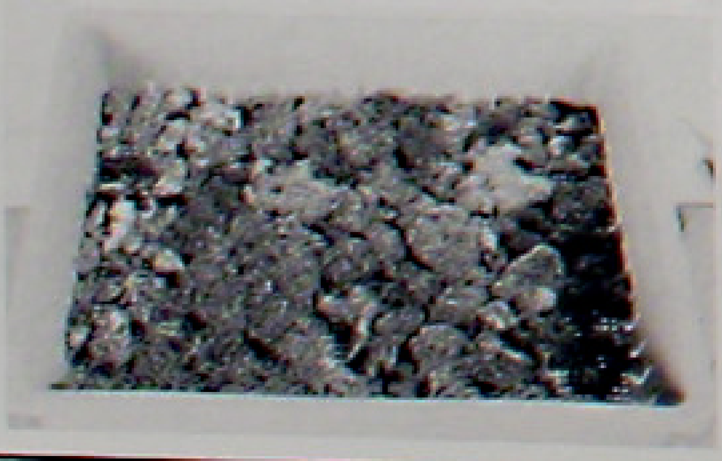
In this case, I have a pine that is not very tall, with a very thick trunk and with abundant branching, particularly near the base. Therefore, it would be difficult to bend the trunk by wiring; I must establish a design by working with the branches. Also, I do not have a very long trunk with which to create a feeling of majesty and age.

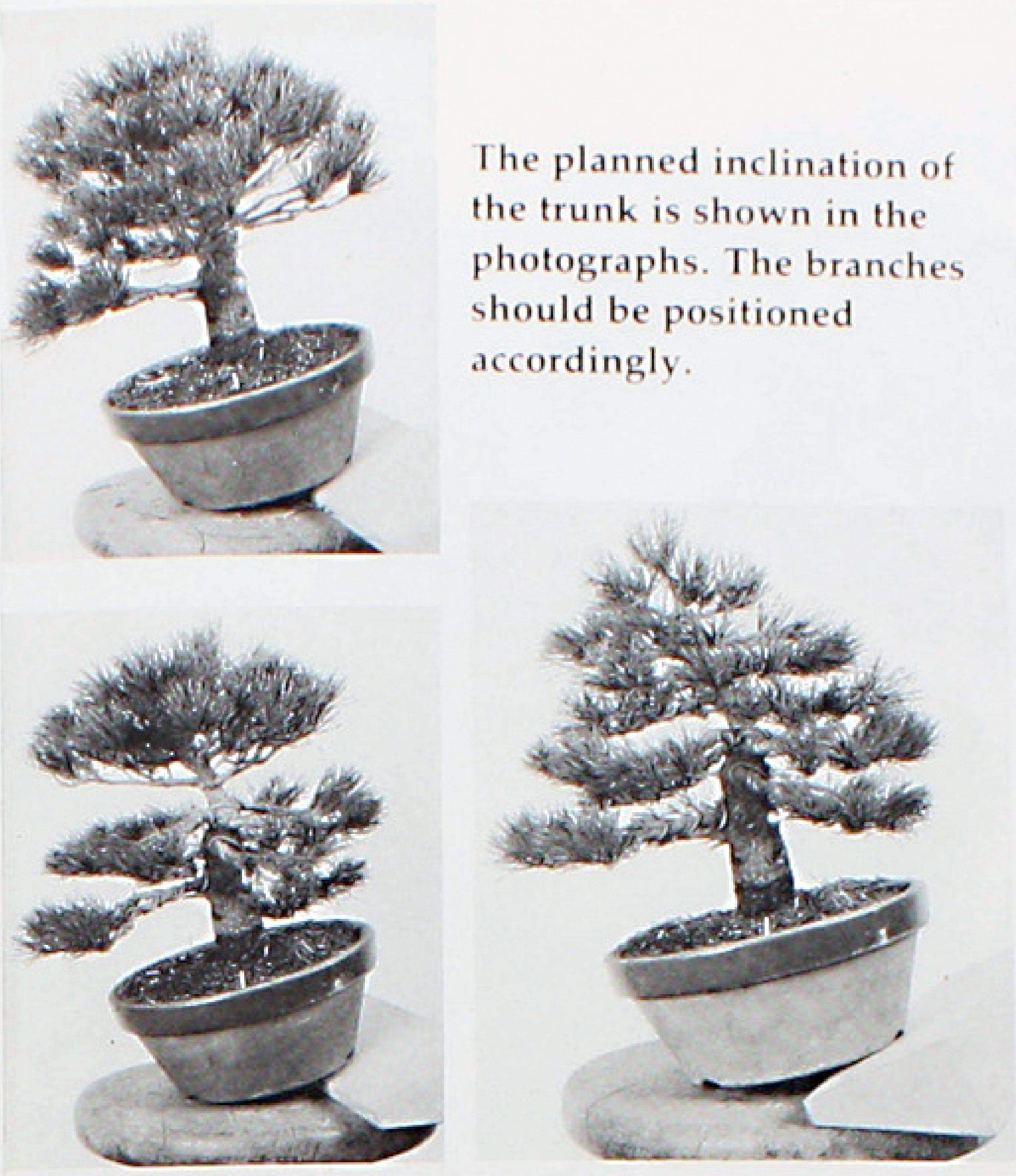
For a tree such as this with a



The plan for the finished composition.

The distinct faces of the rock offer many possibilities for planting. We need to choose the one in which the overall effect is most harmonious, without sharp angles, since the tree's trunk is very gently curved. Moss and accent plants are shown below.



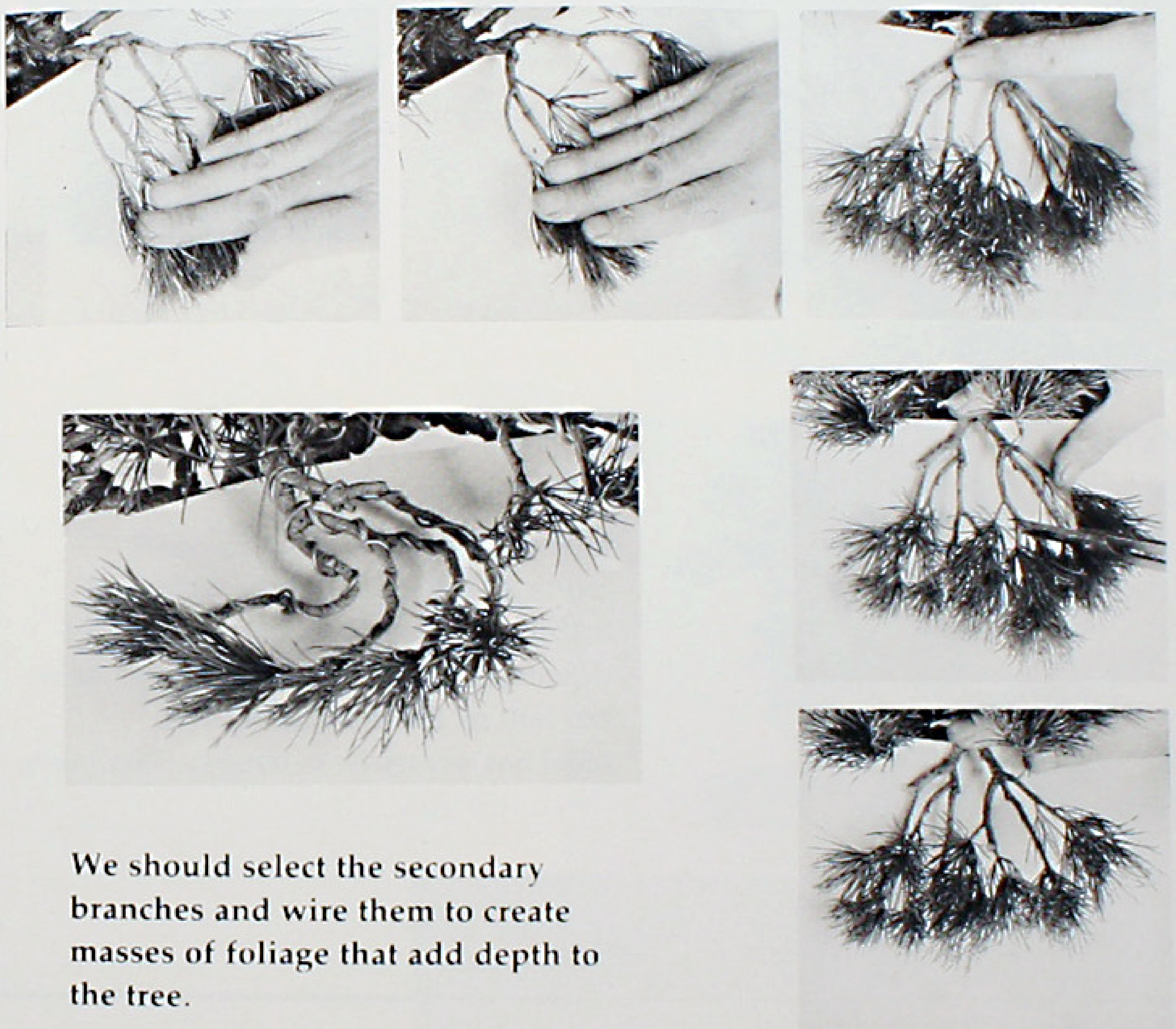


The planned inclination of the trunk is shown in the photographs. The branches should be positioned accordingly.

trunk that is short and thick and without much character, but with an abundance of branches, I see only one possibility: to root it upon a rock. In this way, even though the tree by itself is not very attractive, I can achieve a very striking effect.

I need a rock that is not too tall, of a rugged and angular appearance, preferably dark gray in color to contrast with and emphasize the light green foliage of the pine. Once the rock has been chosen, I look at it from all possible angles to decide which is its most attractive side, and, at the same time, where it would be possible to place the tree.

After selecting the front of the rock, I can then begin to work on the tree. The shortest branches will be close to the rock and the longer ones where the tree slants away from the rock. The first step is the elimination of all branches unnecessary to the design. I then wire the primary and secondary branches and correct the position to give sufficient visual equilibrium to the tree once it is planted on the rock. In this case, it is not as important to achieve a pure silhouette and design as it is to offer an attractive impression to the observer. We are dealing with a combination of elements, not just one individual tree; the important thing is the overall effect, not the separate elements.

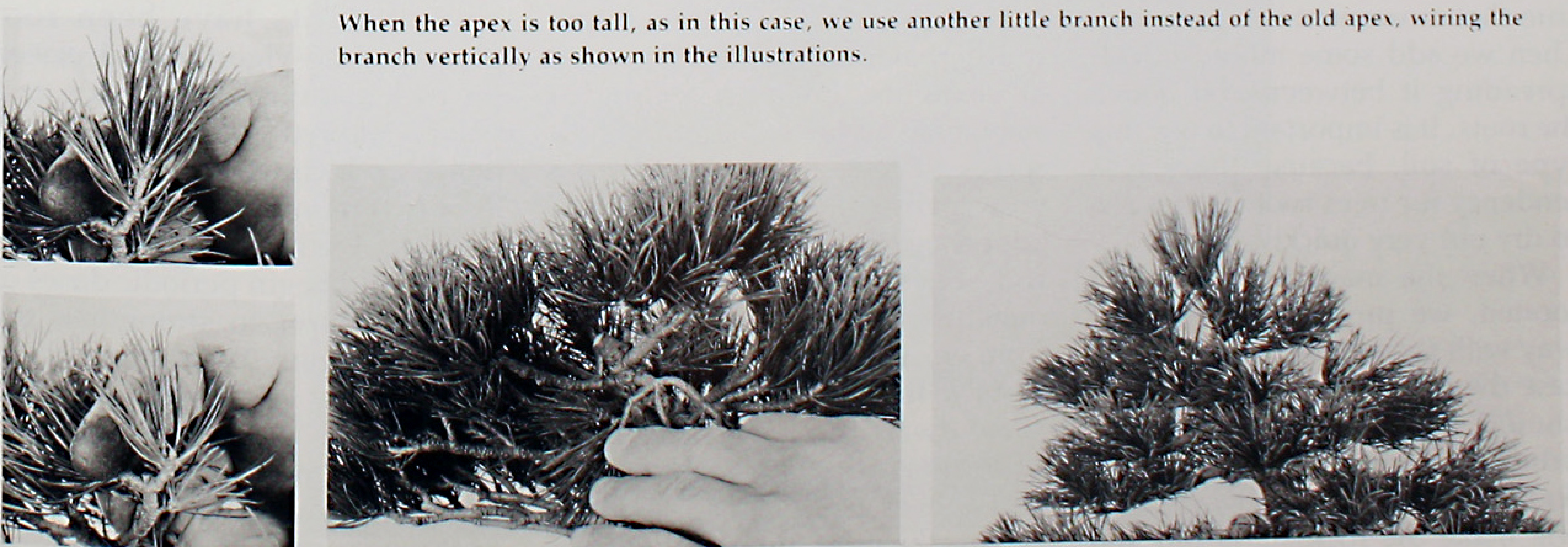


We should select the secondary branches and wire them to create masses of foliage that add depth to the tree.

The rock is then prepared to receive the main tree and the accent plants. To do this, we fasten some wires to the rock, either with fishing weights flattened into the hollows in the rock or with quick-drying cement or contact glue. These will be used to secure the plants at the locations chosen on the rock.

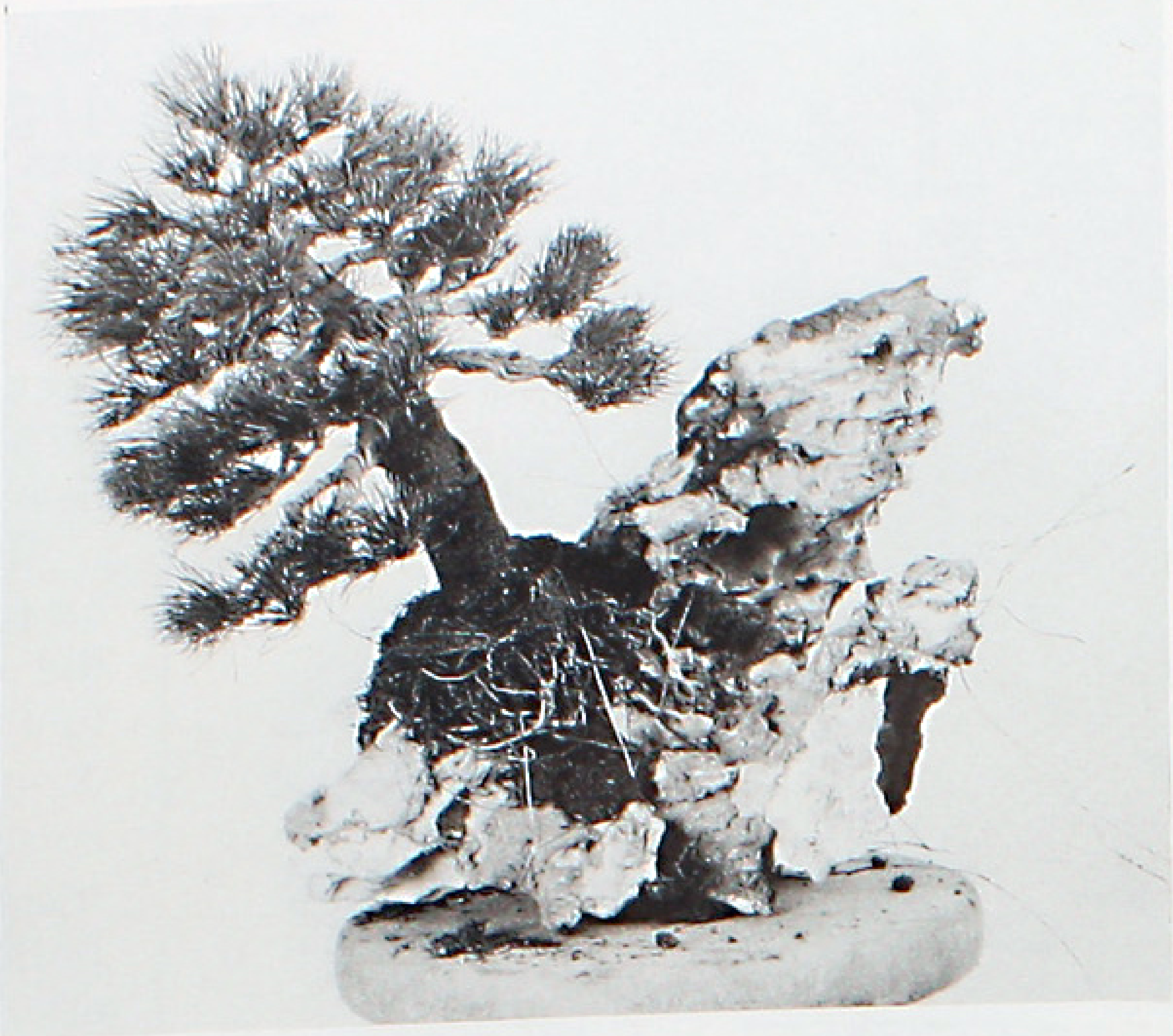
Later, we mix peat with clay in equal parts and add water to this mixture, kneading it until we have a uniformly thick sticky paste. [Editor's note: There are several recipes for "muck": 60% Michigan (sedge) peat or peat humus with 40% milled or cut up long fiber sphagnum or clay.] We then cover the surface of the rock only in the regions that the plants are to be located.

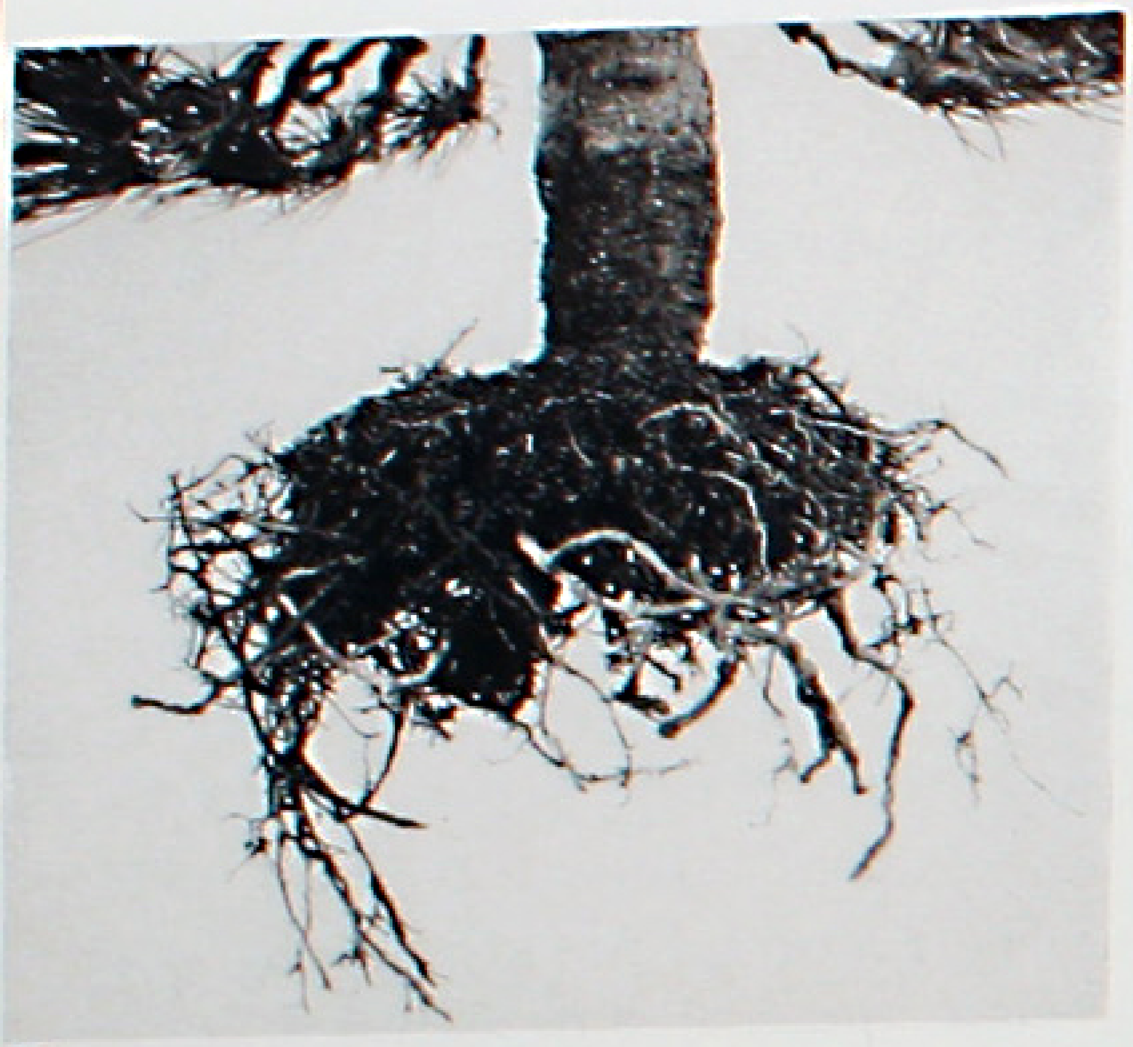
Now we just have to remove the old potting soil from the roots, reducing the root ball as much as possible so that it will fit in its destined place. We should eliminate the taproot and all roots that are too thick or too long. We then position the tree on the rock, securing it



When the apex is too tall, as in this case, we use another little branch instead of the old apex, wiring the branch vertically as shown in the illustrations.

◀ The next step is to disentangle the roots of the tree and remove enough soil so that it can be placed on the rock.

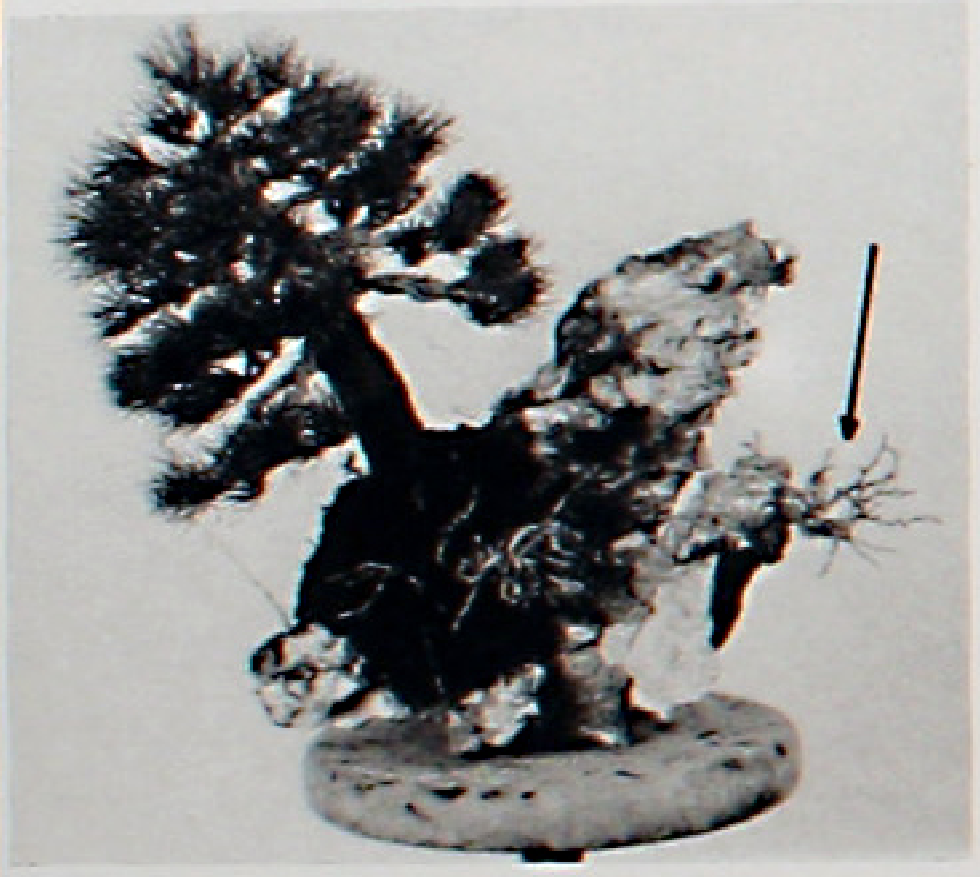


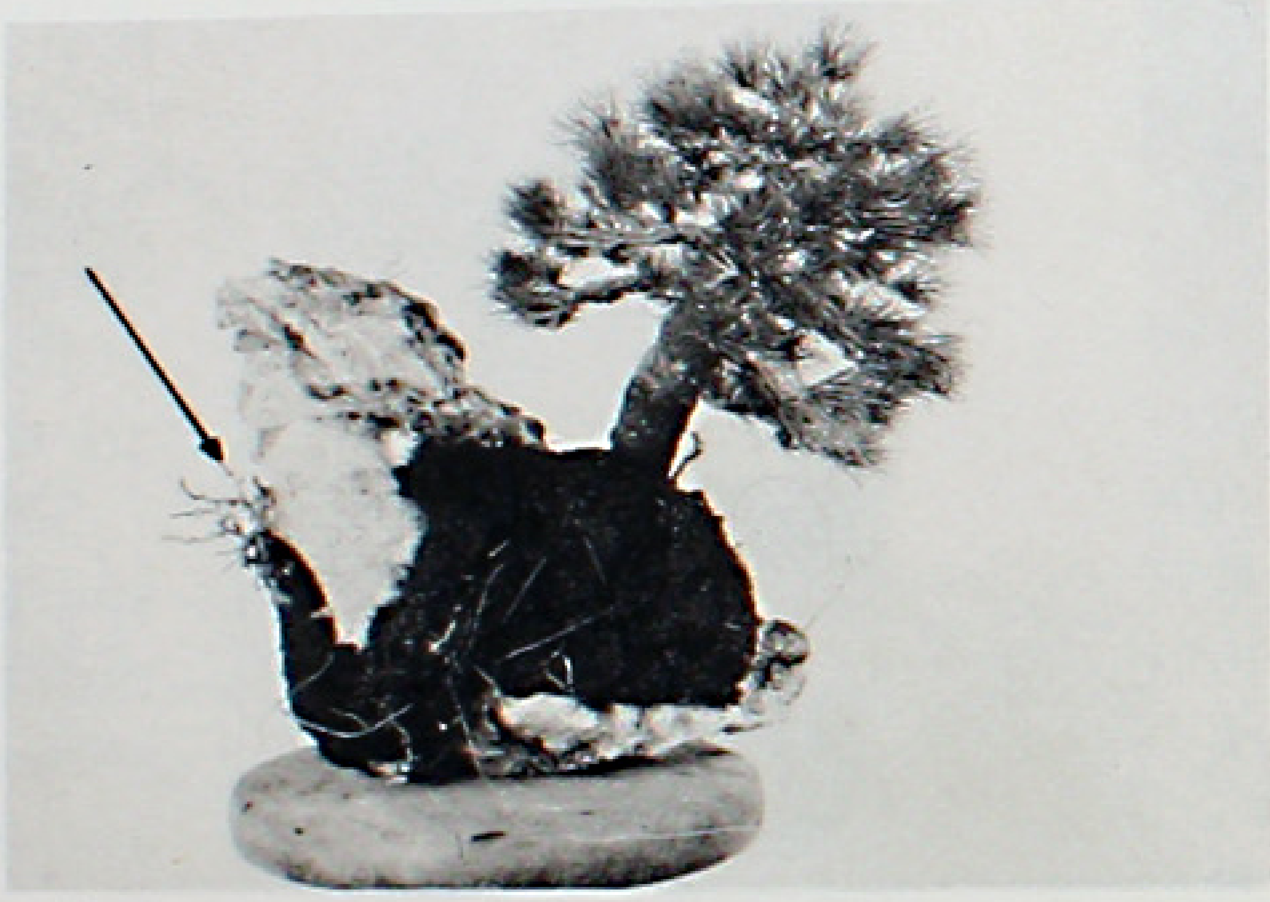


◀ This is how the roots should look.

▲ The tree is secured by wires fastened beforehand to the rock with cement, glue, or even fishing weights crushed into the crevices.

The arrow shows the placement of one of the accent plants. It serves to balance ▼ the strong movement to the left.





firmly with the wires, making sure that movement is impossible. Then we add some more [muck], spreading it between and above the roots. It is important to use this type of soil, because there is a tendency for trees rooted on rocks to dry out very quickly.

When the main tree has been located, we proceed in the same way with the accent plants, in this case dwarf quinces. Accent plants should never compete with the principal elements of the design. So I put them in places where they will make the rock stand out and complement the design.

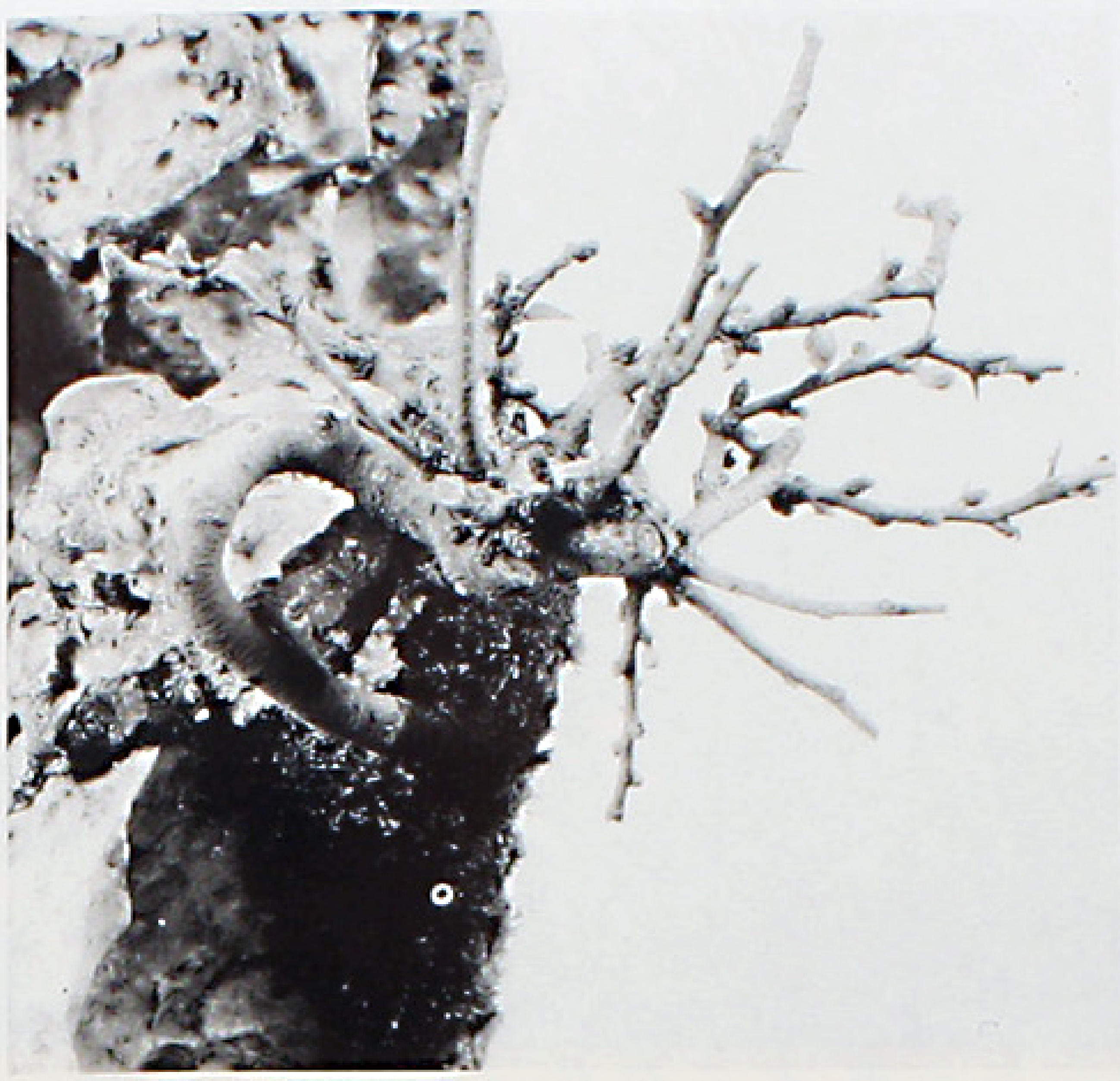
The plant on the right counterbalances the combination of elements, giving a feeling of stability. The lower plant in front serves to hide the root ball from view achieving a more natural appearance. Next I place moss on the soil surface to help retain moisture and protect the plants from erosion during watering.

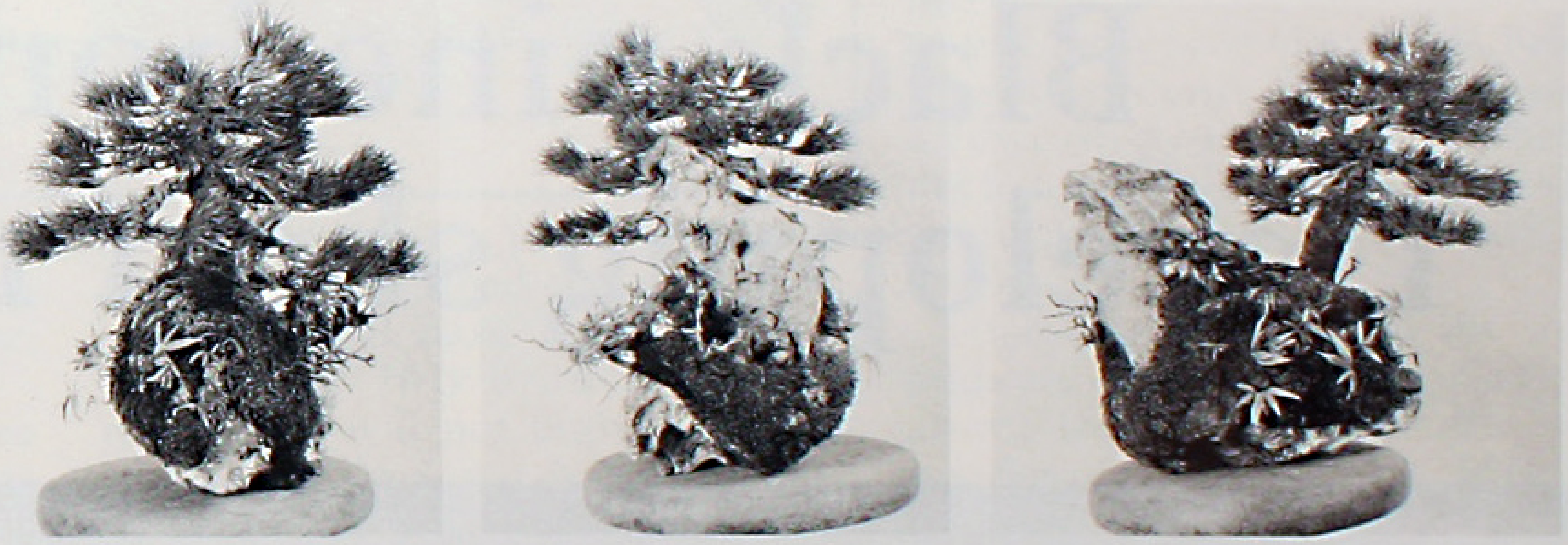
As a finishing touch, I added some dwarf bamboos, which will give the arrangement a more natural appearance.

Now the most important thing is aftercare, since the main tree and accent plants have been root pruned quite vigorously. I placed the rock planting in the shade, in a place sheltered from the wind, and will keep it constantly moist for at least two months.

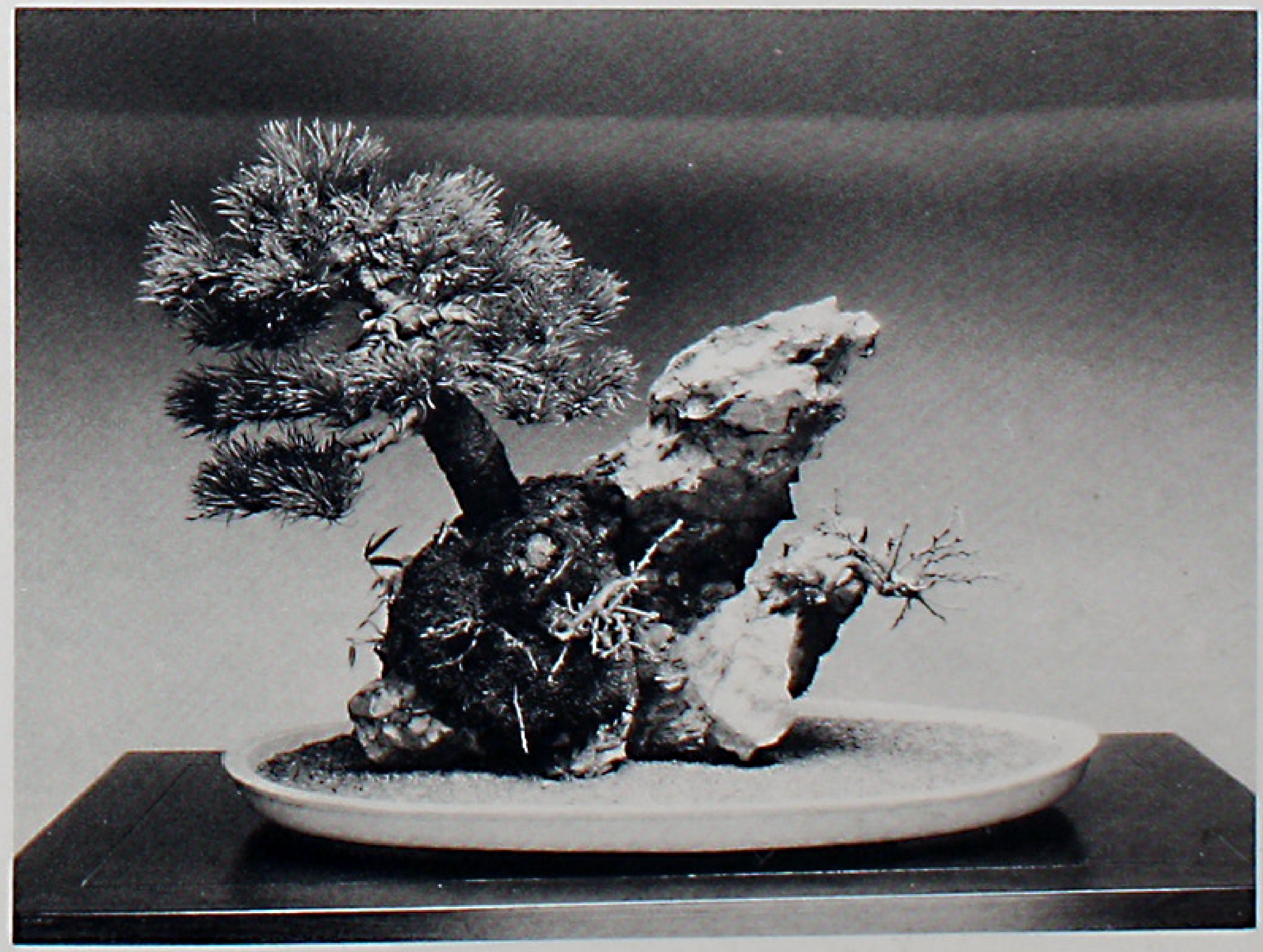
Then, I will move it into half shade, and begin periodic doses of liquid fertilizer to strengthen the trees. I will only know if the planting is totally successful when the roots of the pine begin to grow towards the rock and grip the surface, which will take perhaps two or three years.

We complete the arrangement by adding moss to the surface of the [muck], fixing it with fine wire forks so that the moss will not wash away when we water it. Then, the last touch is to add some dwarf bamboo to enhance the natural appearance of the arrangement.



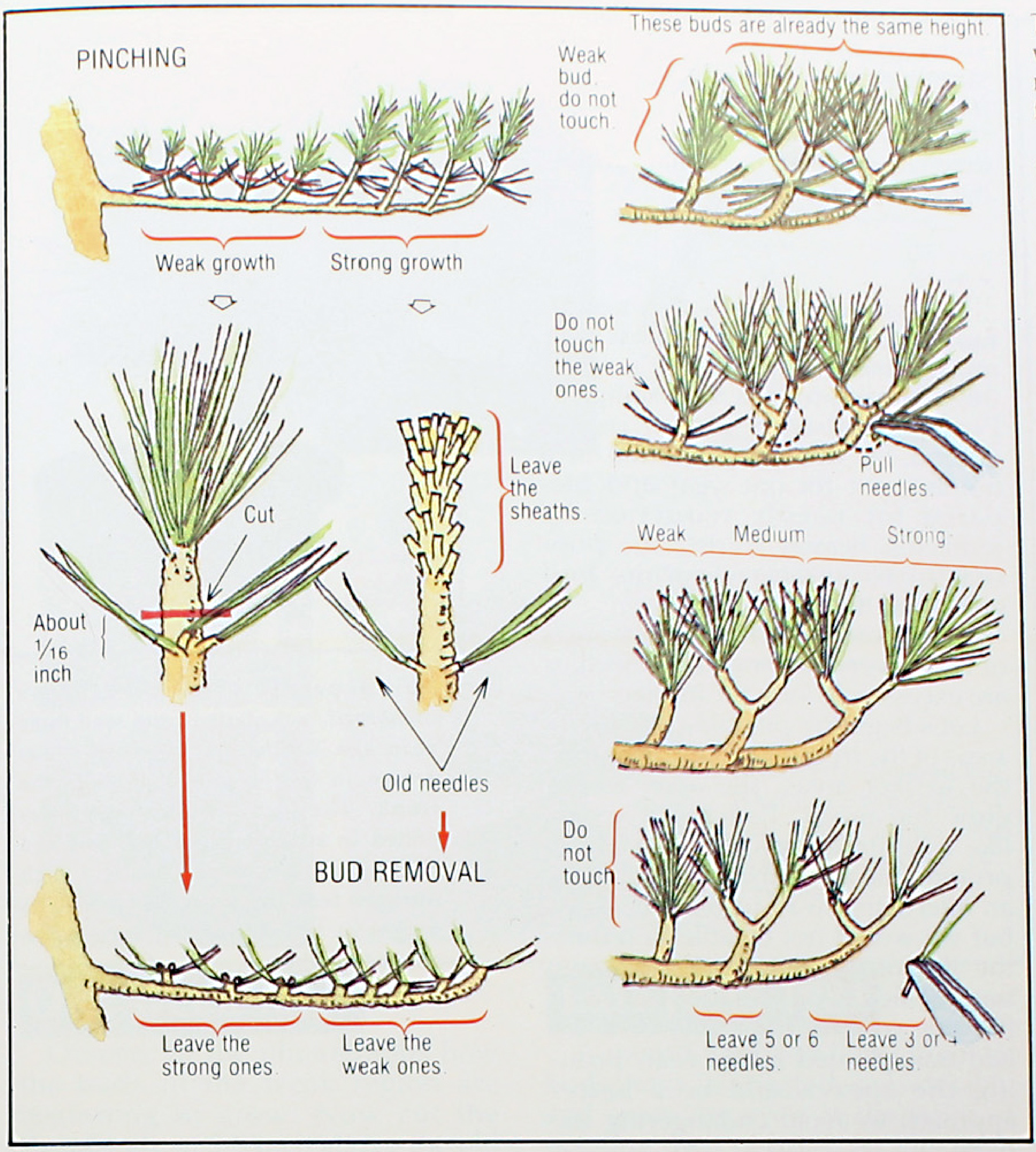


Here are three views of the new *Ishitzuki* or rooted on a rock style. You can see that care has been taken with the back part of the arrangement as well as the front so that the planting is attractive when viewed from any direction.



◀ The finished work, placed on a *suiban*, a tray without holes, containing a little river gravel. Height: 41 cm.

Black pine bonsai
Developing short needles



One of the main challenges in growing Bonsai pines is developing needles that are consistent, in scale, with the size of the trunk.

To overcome this difficulty, there are at present two basic directions that growers make take. The first is to search for varieties (known as YATSUBUSA), which naturally possess shorter needles and denser ramification. The other method involves pinching and selective removal of buds to increase the density and ramification of the tree, with a consequent reduction in the size of its needles. This article offers a needle reduction method that, although dedicated to the Japanese black pine, Pinus thunbergii, can be applied to any two-needle pine; but not to three- or five-needle pines.

The first thing that one has to recognize is that there are up to three distinct growth phases of needles on a pine. Pines are evergreens and this means that they always have needles, but not always the same ones; while some bud, others mature, and others will soon fall. Generally, a needle stays on the tree two or three years, passing through the phases described above.

The second basic concept is the following: if a branch has no needles, it will not bud; therefore, we cannot act as we do with broad-leaved trees and totally defoliate the tree to reduce the size of its leaves.

The process must be gradual, and we need to treat the three types of needles in different ways and in different seasons.

Selective bud removal, in addition, balances the vigor of all parts of the tree, favoring the growth of the weakest buds and taking vigor from the strongest.

Generally, the most vigorous zones are the tips of the branches and the upper part of the tree, while the weakest are to be found in the interior part of the lower branches. The rest of the tree has zones of medium vigor.

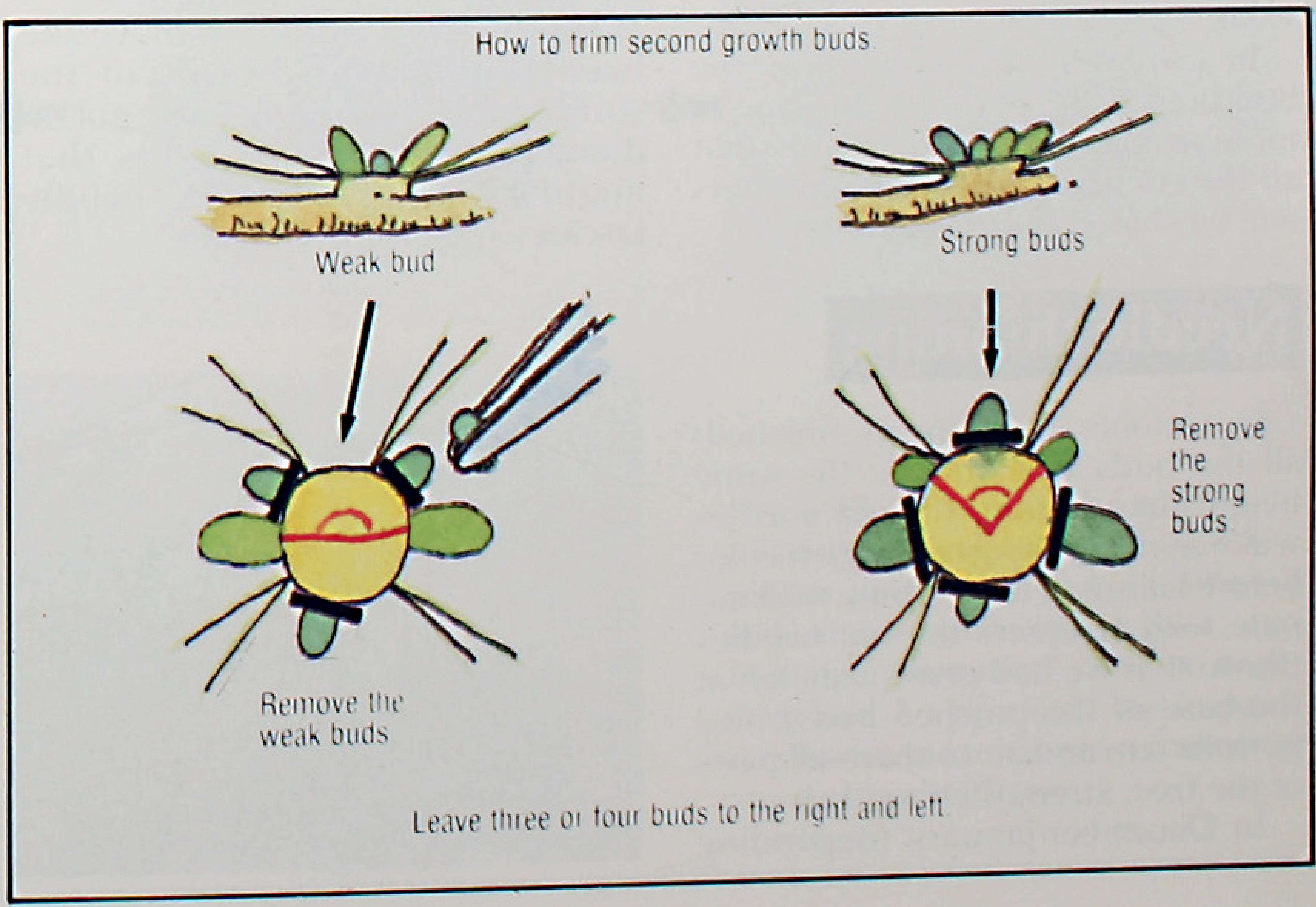
The method about to be described may be quite stressful to the tree, so it is important that the tree be healthy and vigorous [as evidenced by strong bud growth in spring].

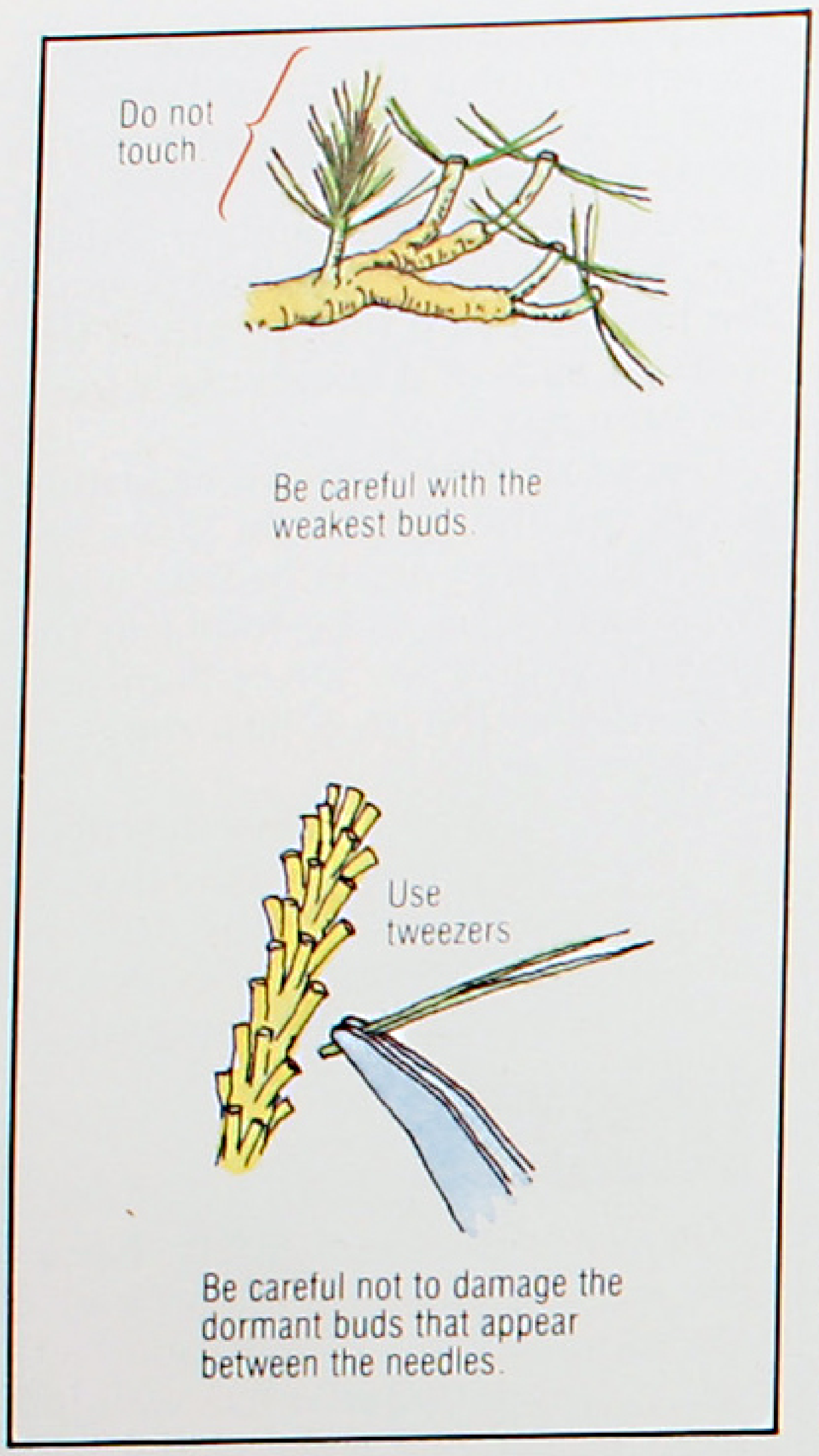
Pinching

Pinching is generally begun towards the middle to latter part of the month of June [early summer], when spring budding has matured. It is important to assess the basic vigor of the tree before proceeding.

Begin by pinching first the weak buds and then about ten days later the stronger ones. The reason for this is to encourage the weaker buds to put forth secondary buds before the stronger ones. But, if there were an excessively weak bud, it is better not to touch it until its strength is the same as that of the rest of the branches.

At the same time that the weak buds are cut (at about 1/16 of an inch above the old needles), the new needles of the strong buds are pulled with tweezers, just leaving the sheaths that contained the needles.


How to trim second growth buds
Weak bud
Strong buds
Remove the strong buds
Remove the weak buds
Leave three or four buds to the right and left


Do not touch
Be careful with the weakest buds.
Use tweezers
Be careful not to damage the dormant buds that appear between the needles.

Bud trimming

Ten or fifteen days after pinching, new second growth will begin to appear in the fascicles of the weak buds. That is the time to cut from the strong buds the part that we had left without needles. Later, selectively remove secondary buds to balance the vigor of the tree as follows:

Remove the weak secondary buds from the original weak bud location, just as the diagrams show.

Similarly, remove the strong secondary buds from the areas of greater vitality (remember they will appear one or two weeks after the weak ones).

In this way, the strength of the budding in all parts of the tree is more in balance, which means that all the energy absorbed by the roots will be shared more equitably.

Needle thinning

In October, budding is finished; all the buds will now be the same height. In addition, the old needles will begin to take on a reddish color before falling. It is now time to eliminate with tweezers the old needles (those that we had previously left at the base of the pinched buds); this permits sun and air to reach all parts of the tree, strengthening them.

In December/January (depending on the vigor of the tree), remove some of the new needles. In the strong areas, leave only 3 or 4 pairs; in the weak, 5 or 6 pairs, but again the very weak should not be touched, so that they may achieve the vigor of the others.

* * *

In essence, this is the needle reduction method that is most commonly used. But now let's apply these procedures to a real example, a Pinus thunbergii grown in the ground for two years, potted in a training pot for one year and prepared for needle reduction by fertilizing heavily during the prior season to ensure vigorous bud growth in the spring.

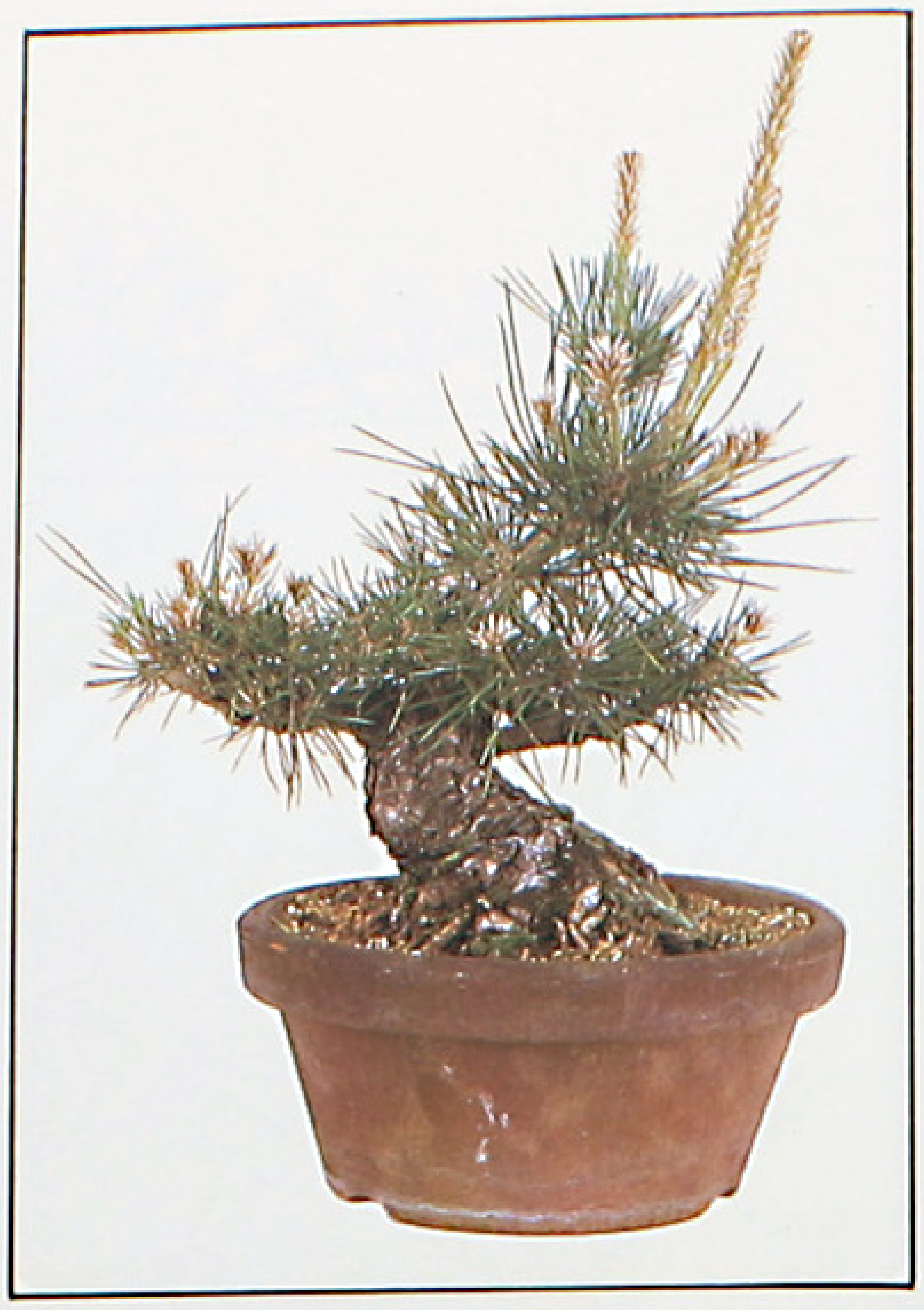
As you can see, this pine has areas of very diverse vigor and the needles are excessively long for its size.

Let's begin by pinching the lower areas of the tree; if we didn't begin in the weaker areas, the apex would grow too much. Perhaps it seems like a contradiction that we aren't pruning the apex first; this would be an alternative way to restore vigor, but we would not be able to reduce the size of the needles at the same time, which is our final objective. If the tree were not healthy, or if we had transplanted it this year, pruning the apex would be a better approach to avoid endangering the plant.

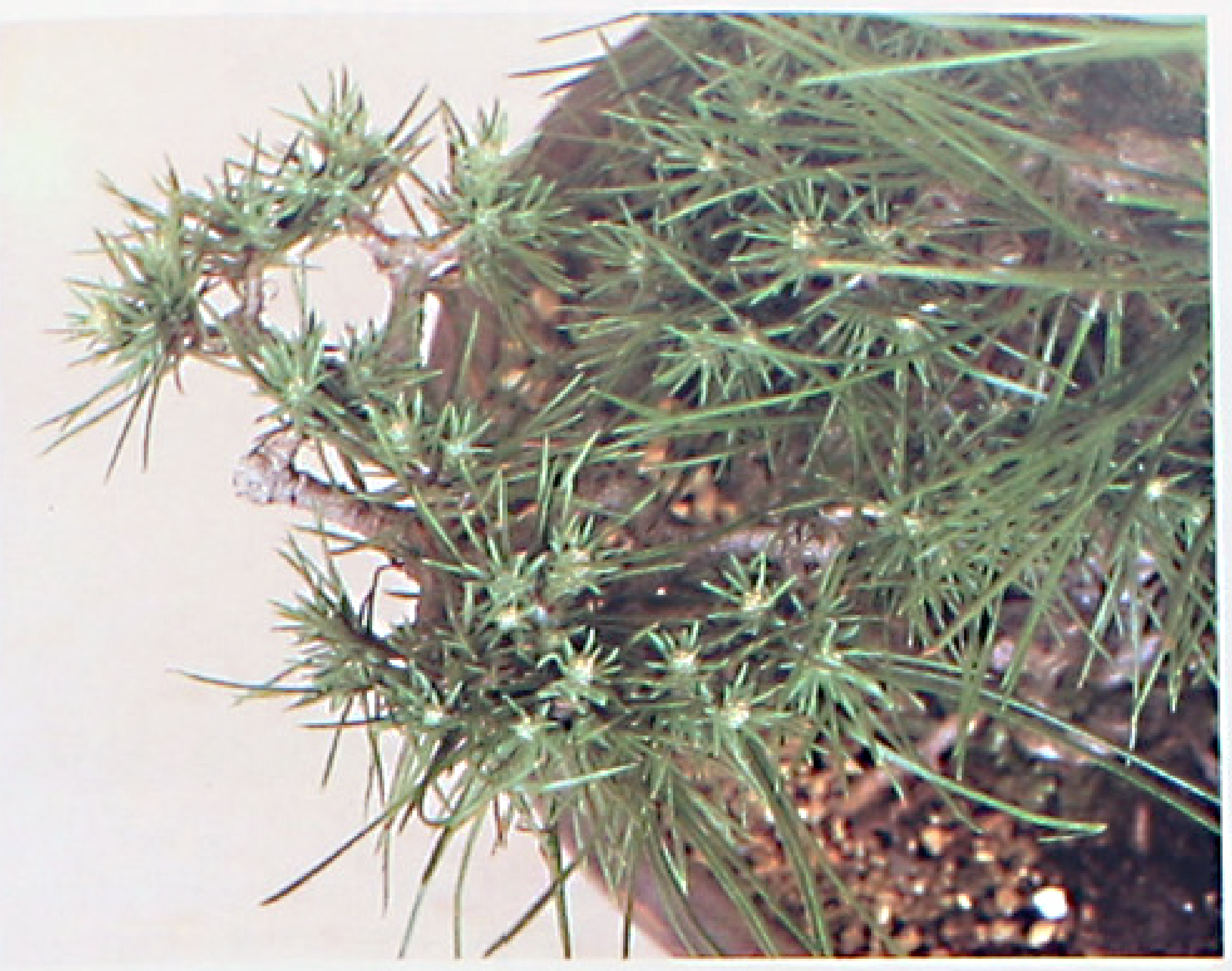
Late June, 1984

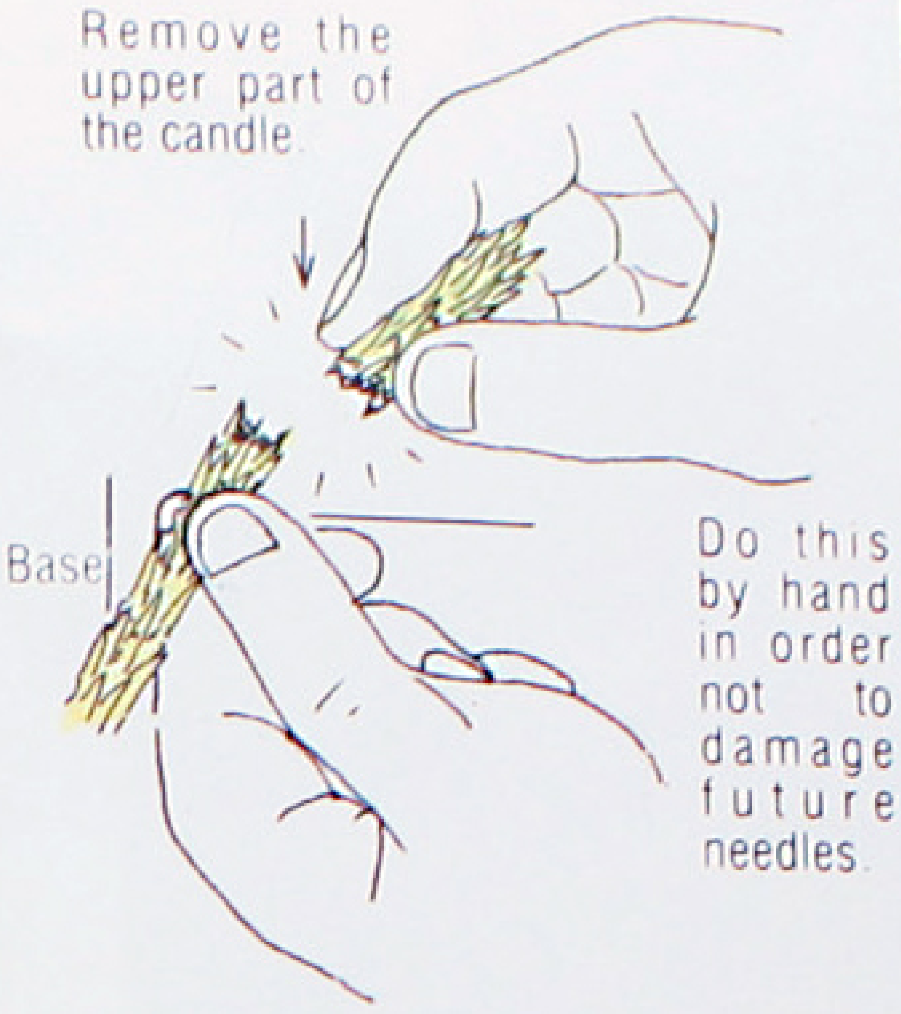
First, pinch the weak buds with very sharp scissors. Very weak buds should not be touched. Remember to cut about 1/16 of an inch above the old needles.

Then, with tweezers, remove the needles from the sheaths of the strongest buds, taking care not to damage any dormant buds that might be growing in the needle fascicles.



This Japanese black pine, *pinus thunbergii*, was started from seed three years ago. For the first two years it was grown in the ground to thicken the trunk. The following spring it was potted in a training pot and fertilized heavily for one season using a high nitrogen fertilizer every two weeks. Its height at the end of the season was about 10 inches.





Remove the upper part of the candle.

Do this by hand in order not to damage future needles.

Upper illustration: If you do not wish to cut the apex, you can pinch the candles as shown.

Lower left illustrations: What was a bud in July is now a little branch. The ramification is intensified.

One week later

Observe in the photographs how the buds in the weak region are beginning to grow. Now cut the sheaths about 1/8 inch above the old needles of the former vigorous shoots. In the second photograph, the tree's appearance after pinching may be seen.

Late July, 1984

A month after pinching, the new buds have elongated considerably and some are even at the point of opening their needles. At this time, selectively remove the new buds, eliminating the weak buds from the weak area and the strong buds from the strong growth area. This can be done with the fingers, but, in order not to damage the buds, it is preferable to use tweezers. Leave 2 buds in the stronger areas and 3 or 4 buds in the weaker ones.

Early October, 1984

In October proceed to remove the old needles. The exception is where a branch needs more buds. In this case, do not remove the old needles at this time. The following spring, pinching will encourage the budding of adventitious buds (buds that appear in very lignified areas of the bark).

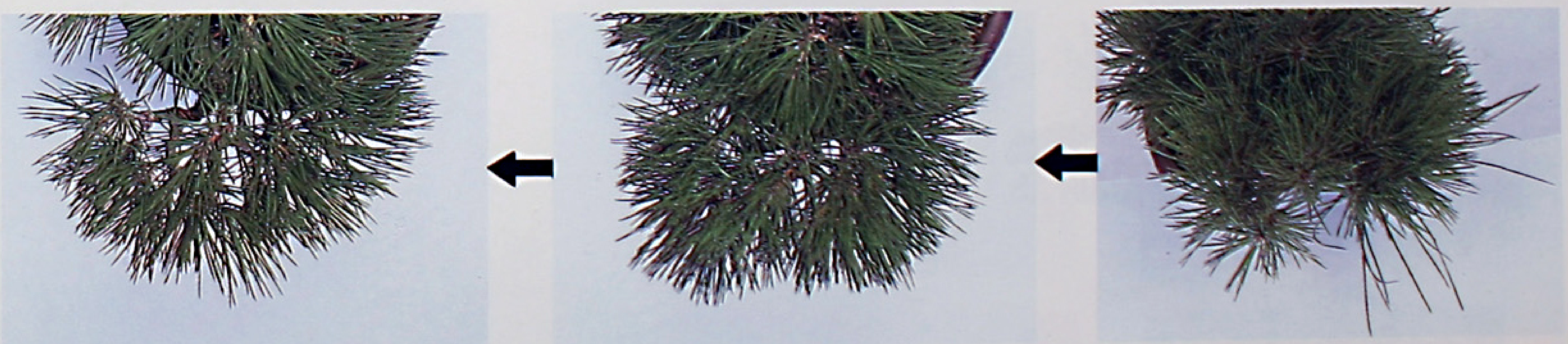
The pruning of the growth at the apex is left until midwinter, for the tree will feel the effects less in the dormant season. If it is not desirable to prune branches at the apex, then candles at the apex can be pinched by hand, as shown in the diagram. This will stimulate the growth of lower buds, but the tree will not be as balanced in vigor as it would have been had the apex been pruned.

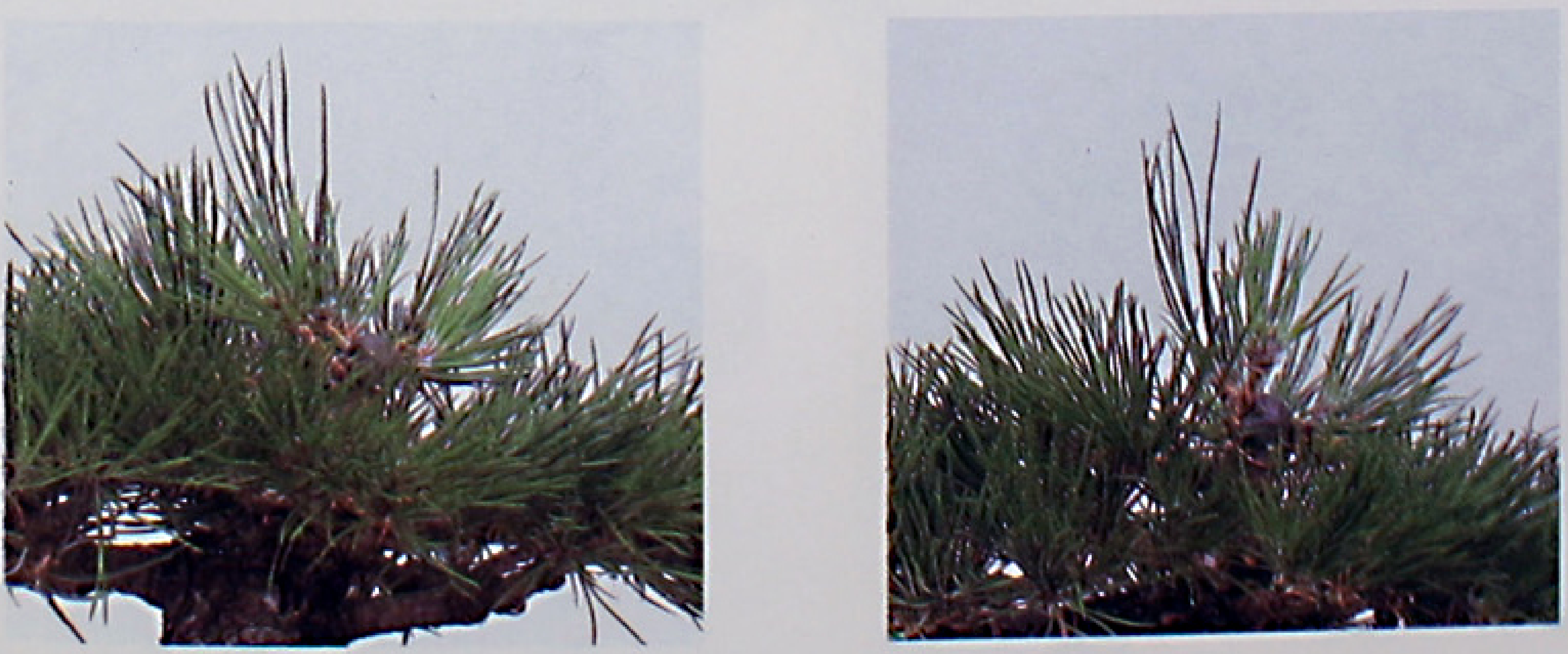
In this series of photographs, the process of winter pinching and pruning is shown. In summary, the following has been done:

— Elimination of old needles to encourage the circulation of air and to admit sunlight.

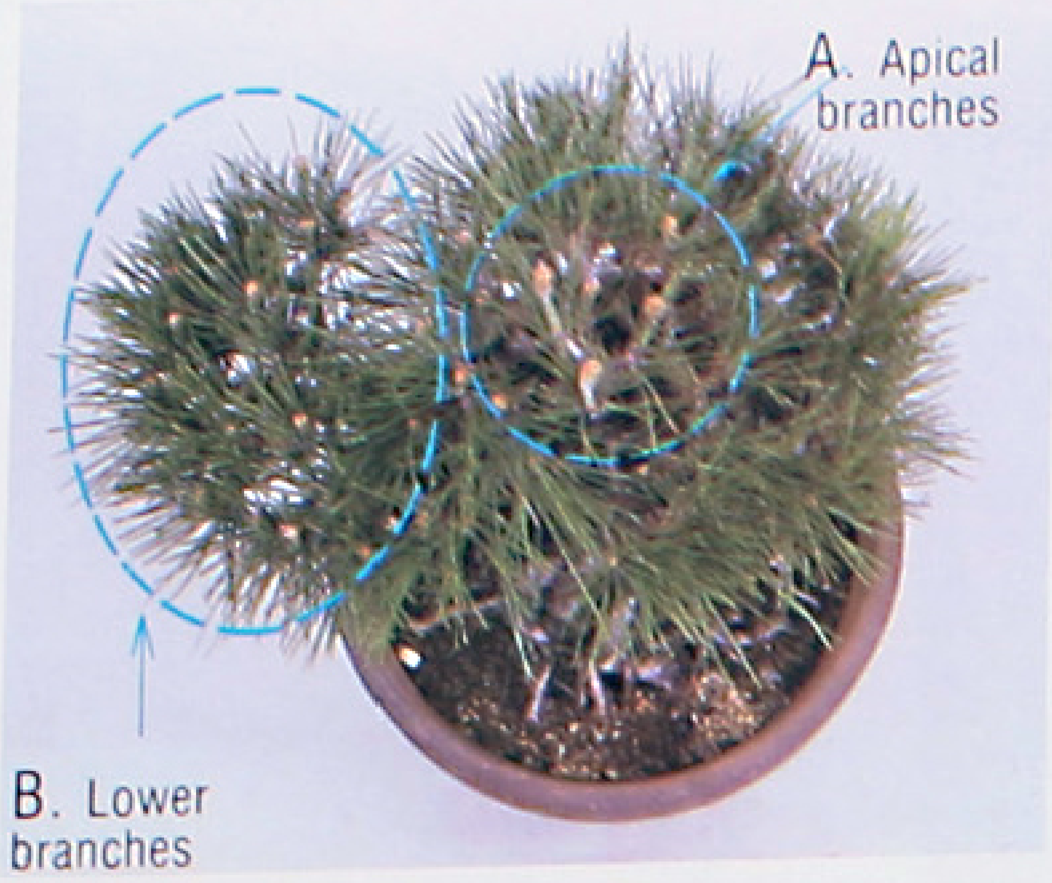
— Removal of needles, leaving 3 to 4 pairs on vigorous buds and 5 to 6 pairs on weak ones.

— Thinning out the apex zone by eliminating a top branch that was too strong.





The upper illustrations show the elimination in mid autumn of the old needles admitting air and permitting sunlight to fall on the interior buds. The lower illustrations show the development of a new apex. The strong apex branch had been removed to balance the vigor of the tree.



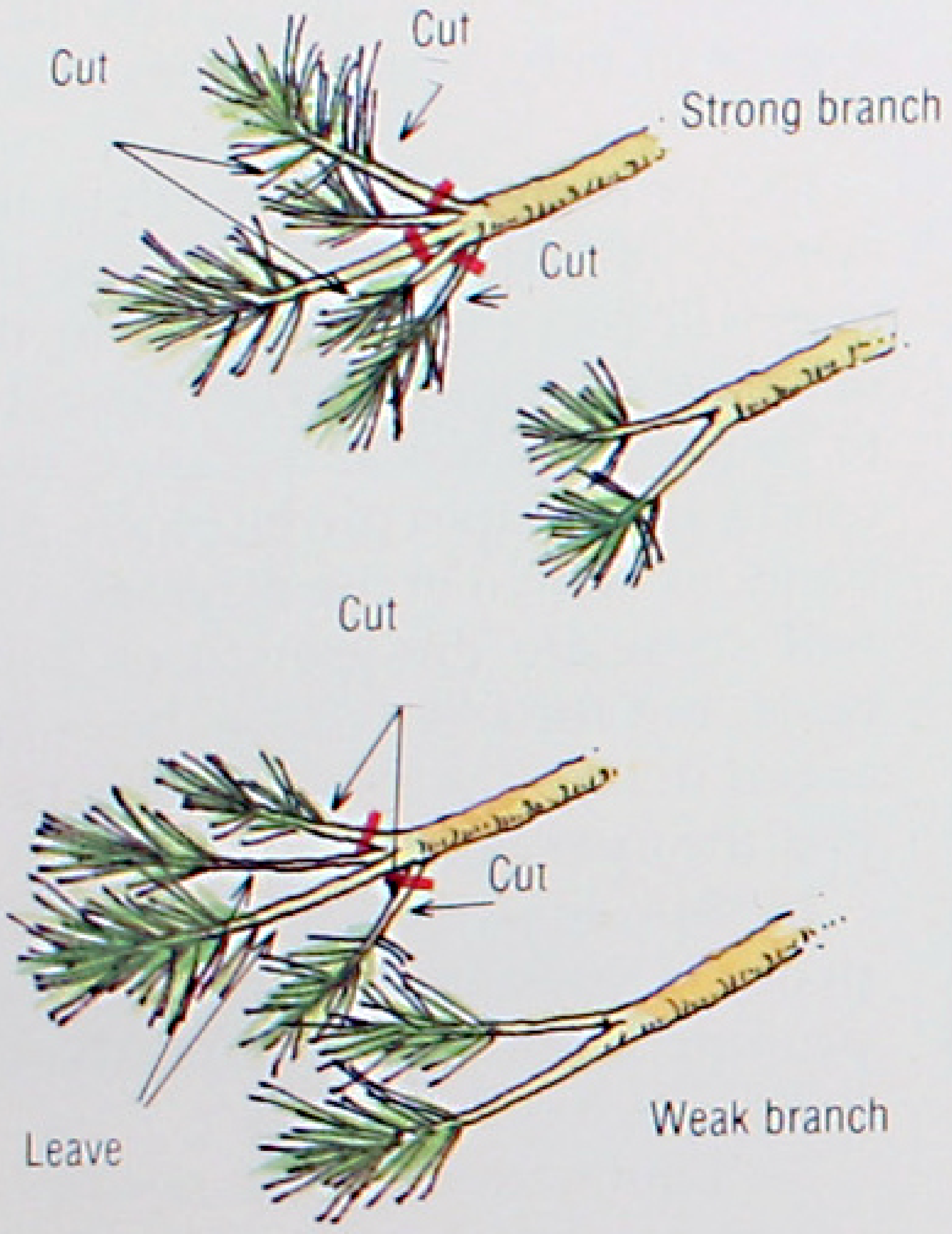
Late April, 1985

The pine now begins to bud. The photographs show two zones marked with blue dashes. All the buds in zone A have the same vigor; all the buds in zone B also have the same vigor; but if we compare both zones, the buds in zone A (the apex of the tree) are stronger than those of the lower branches.

To correct this imbalance, let the needles grow and then remove small branches as illustrated in the diagrams. With sharp scissors, cut all the little branches that are strong from the areas of strong growth, and all the small branches that are weak from the weaker, leaving the strongest. If there is a weak little branch that should be preserved because of the direction of its growth, do not cut or pinch it, but let it grow until it is equal in vigor to the others.

Mid July, 1985

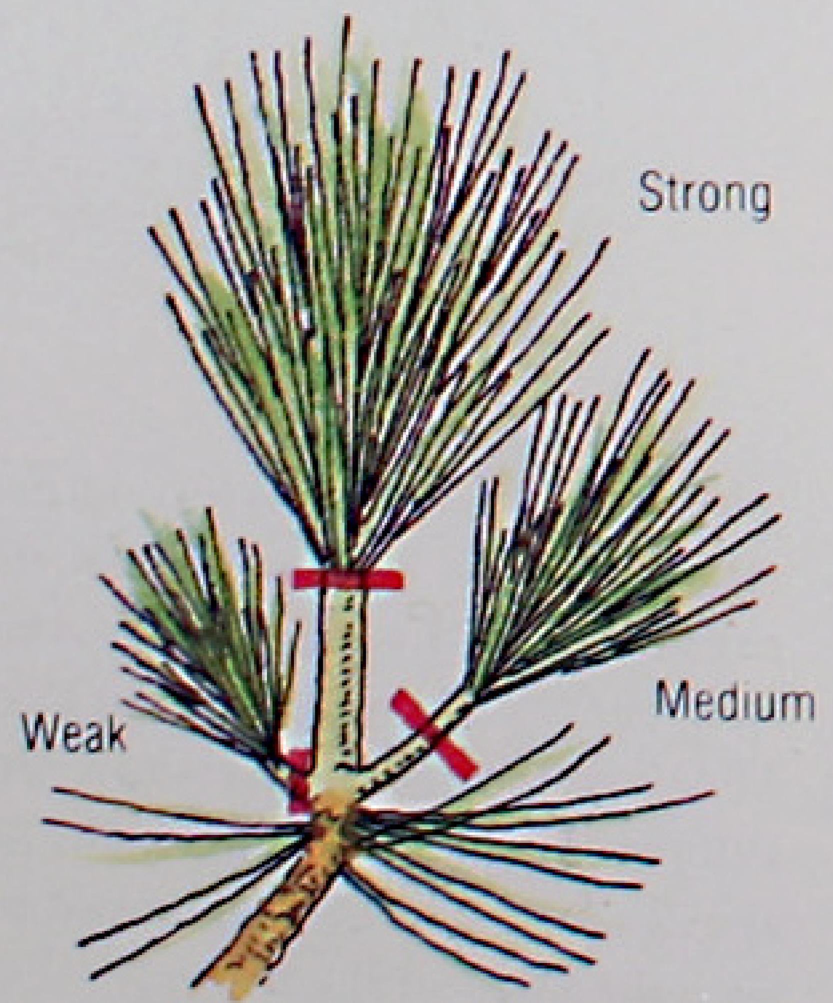
The tree's growth has corrected itself considerably, but the little branches at the apex are still too vigorous. Therefore, use scissors to remove growth at the apex in the following manner: from the longest branches, cut just below the level of the new needles; from the medium ones leave about half; and cut the



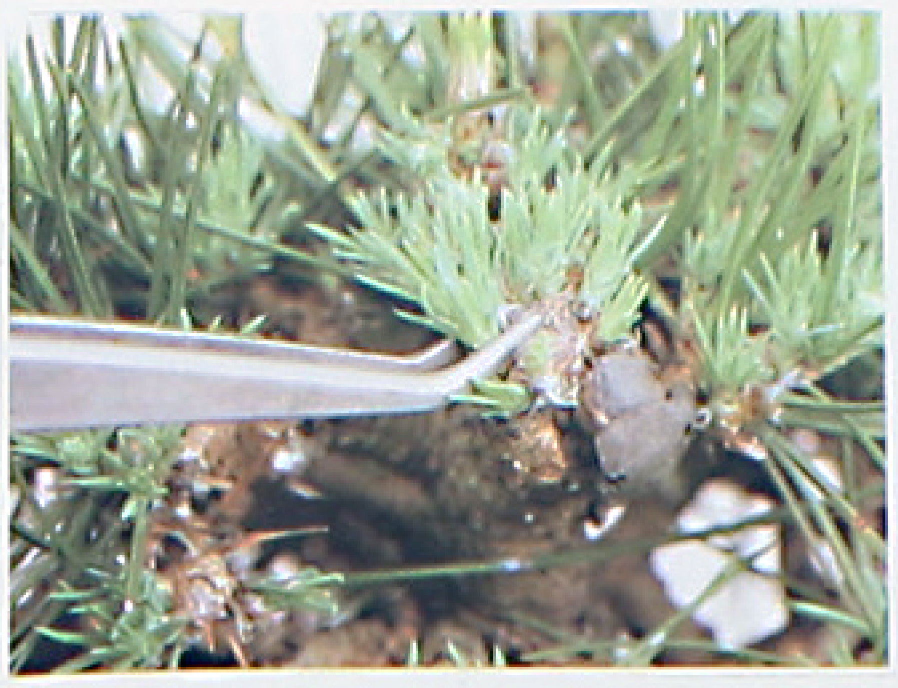
In April, selective branch removal begins, depending on their strength. By using very sharp scissors, with long handles, the interior of the plant can be reached without breaking some exterior branch through carelessness. Try to avoid cutting any needles, because the ends will turn to an unsightly brown color.

- Now is the time to direct the strength of the tree's budding. Keep in mind that the work that is done now will influence budding next year. To strengthen the growth of the lower branches, we will only thin the highest branches. The lower photograph shows the tree once the apex has been thinned.

Where to prune

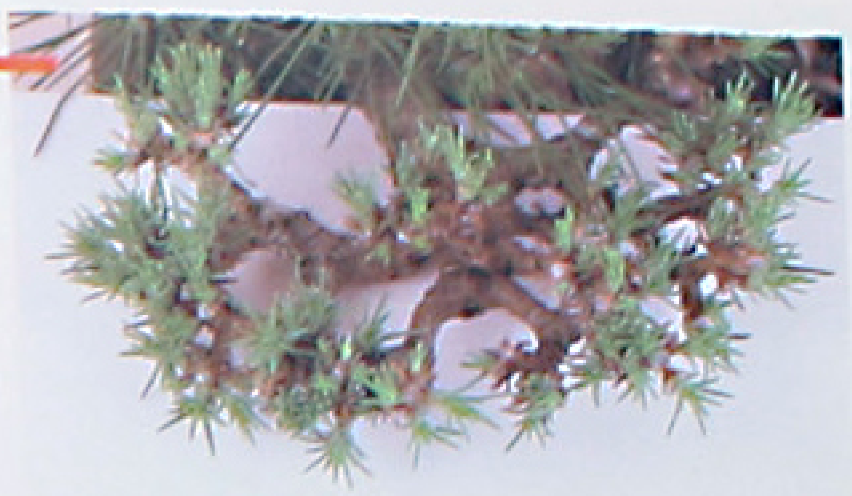


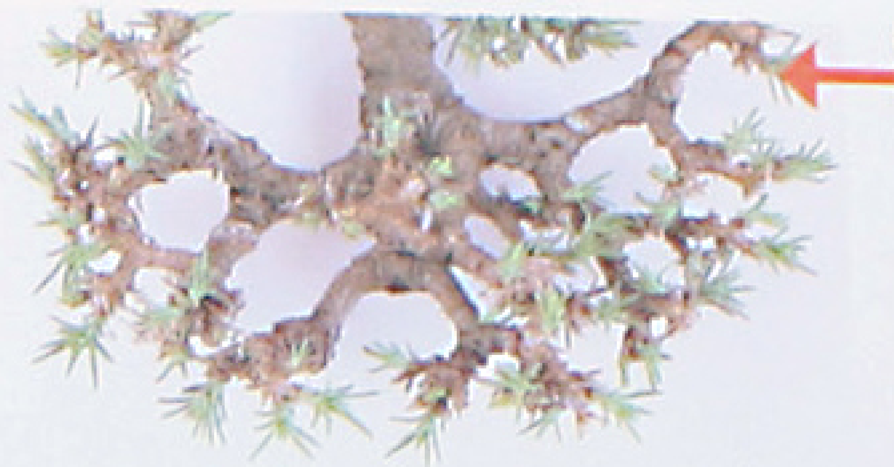
Mid August, 1985

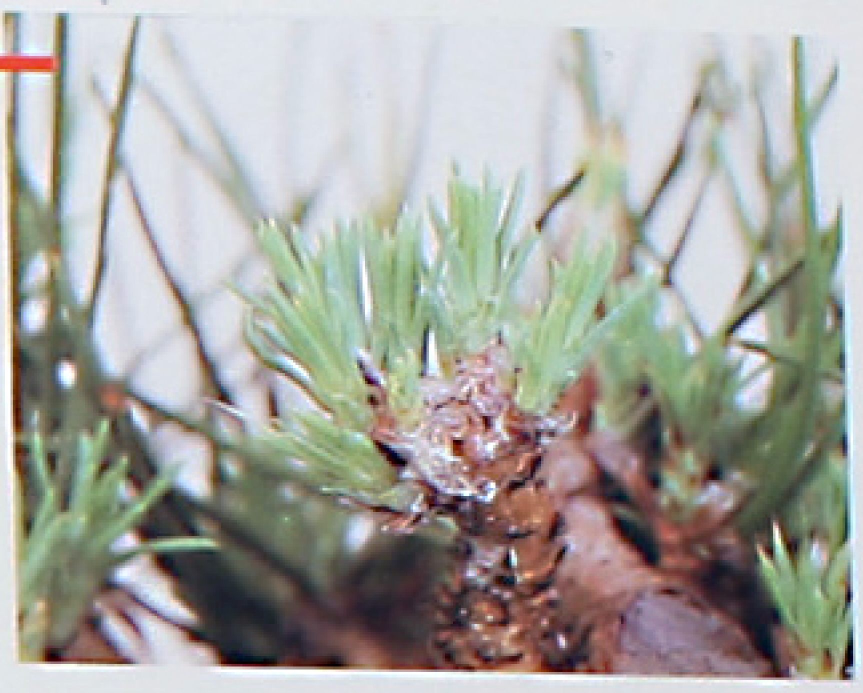

When the buds are about ¼ inch long, remove those that grow in the wrong direction.

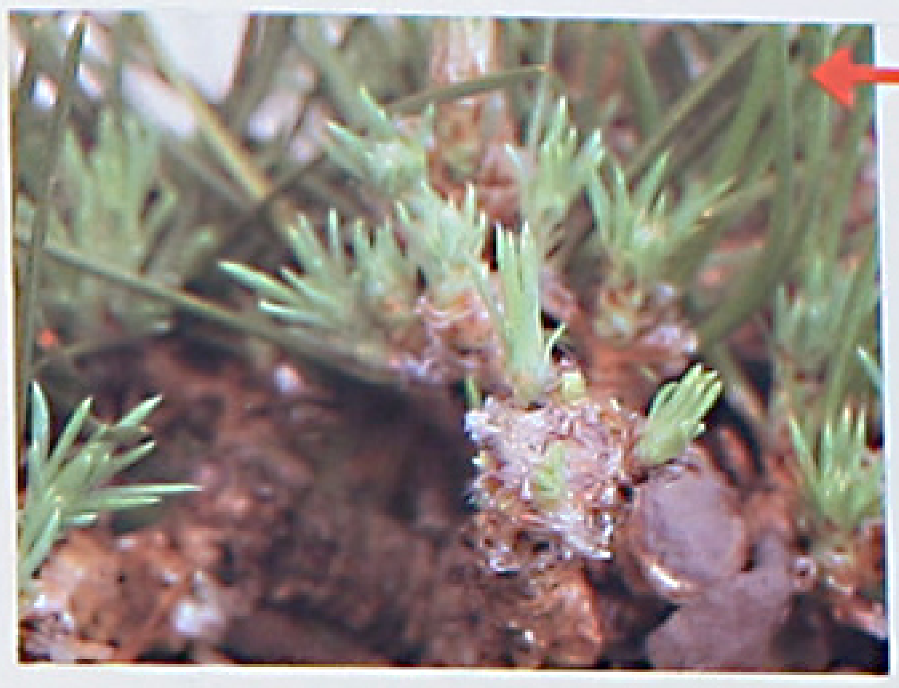
The photograph below was taken 30 days later.

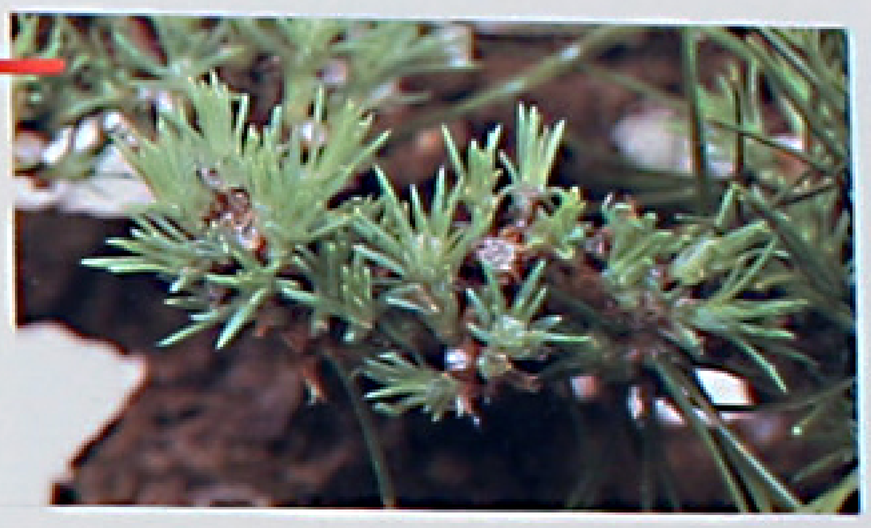
WARNING: Generally, leave more needles. In order to clarify the technique, more needles have been removed than is normally the case. This plant survived nicely, but such drastic needle removal should only be attempted with a very healthy pine.

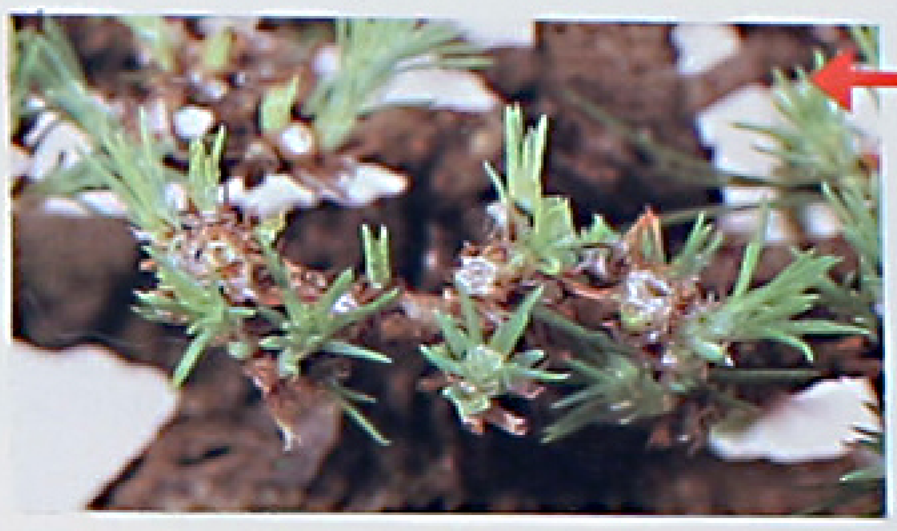

These are the buds of a strong branch.

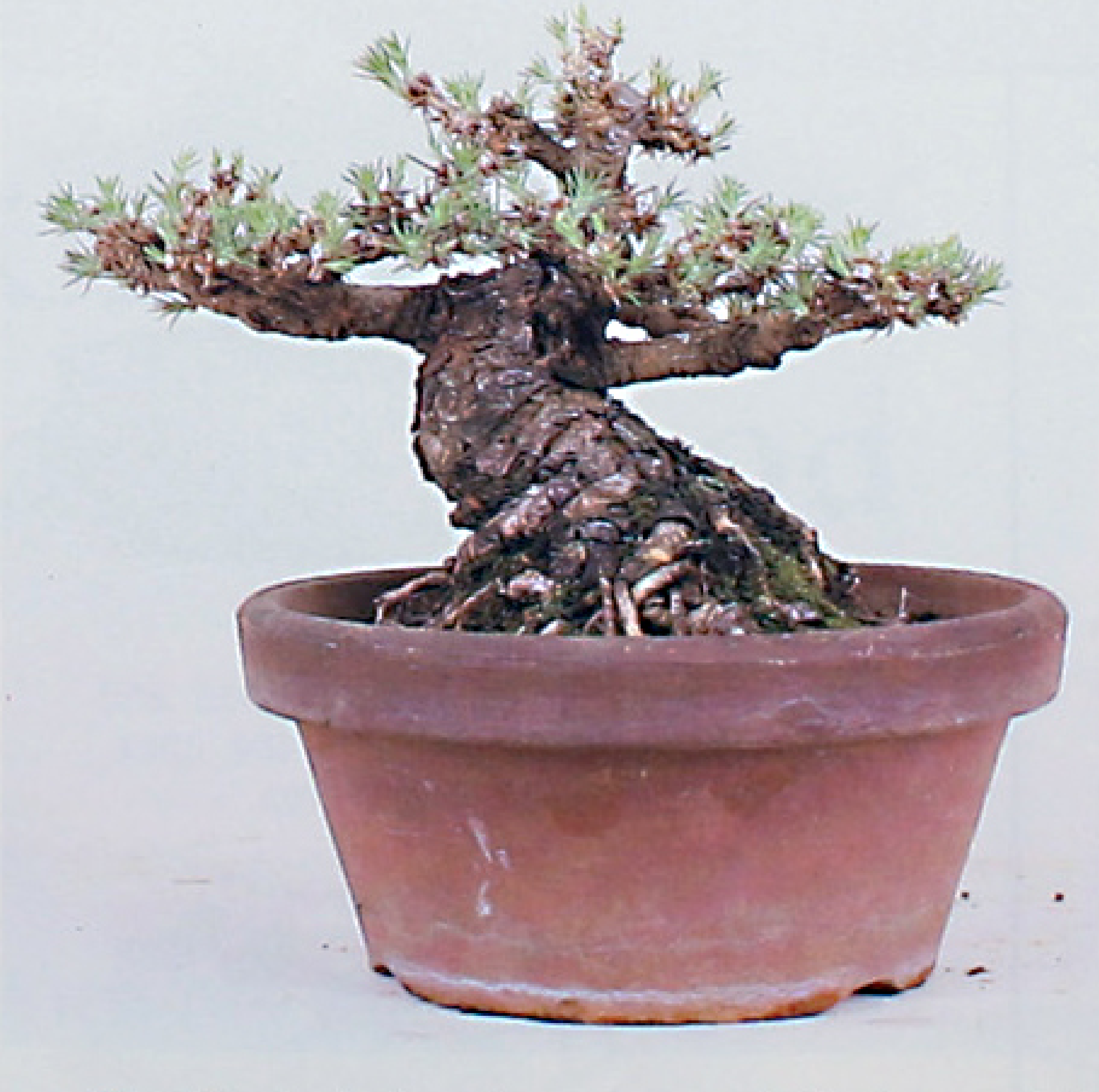

Leave only the weakest buds.


Of all the buds that grow at the end of pruned branches...

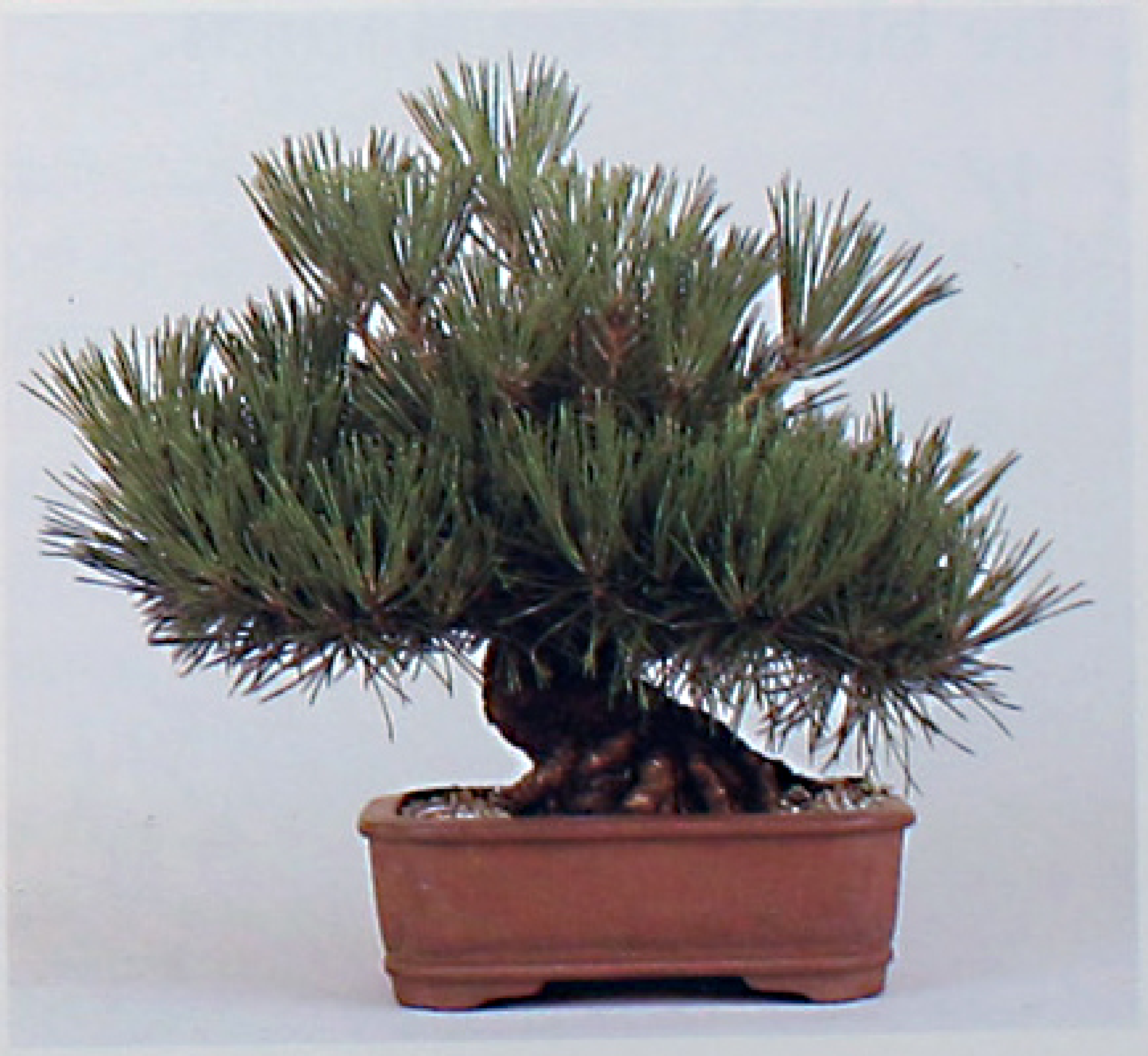

Leave only two or three buds growing in the directions you want.


This is a weak branch, situated towards the middle of the tree.


Therefore, leave six or seven buds on each branch.


Once the buds have been removed, the tree is not touched until the following year.

Early July, 1986



Buds are selectively removed every two or three years; pinching and eliminating old needles is done every year.

weakest ones level with the trunk. The drawings show the trimming of the apex.

Mid August, 1985

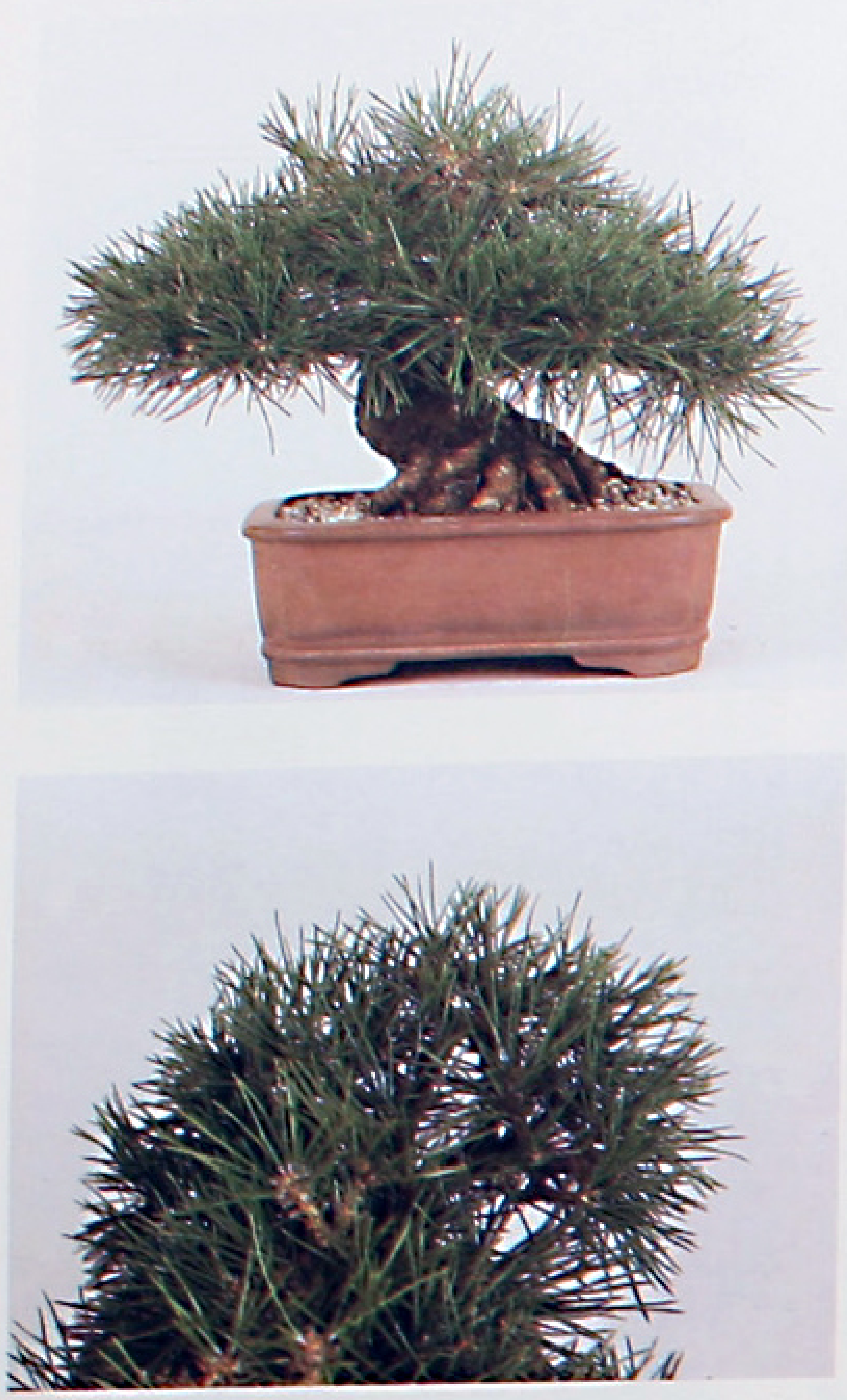
The new secondary buds have begun to grow and it is time to remove the unwanted buds. When they are approximately 1/4 inch long, retain only those that are growing in the proper directions.

Generally leave many more needles than shown in the photographs, in which, so that the direction of bud growth may be seen, many needles were eliminated before their time.

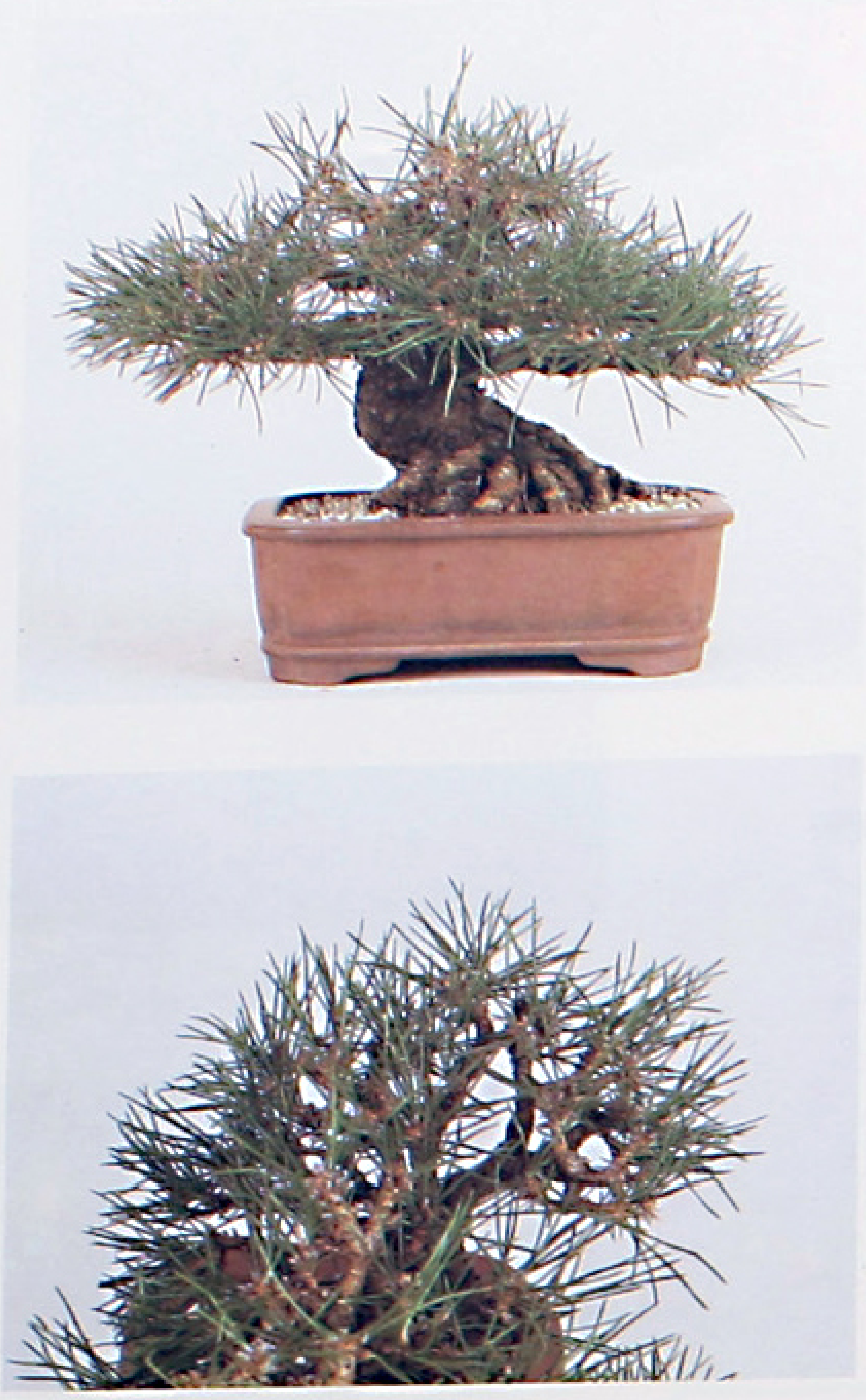
Mid July, 1986

Two years after beginning the pinching, the tree's appearance has changed considerably. It was healthy and strong and was transplanted in the early spring into the Bonsai container as shown in the photograph. Now selectively remove secondary buds only every two or three years; but pinching and needle removal should be done every year.

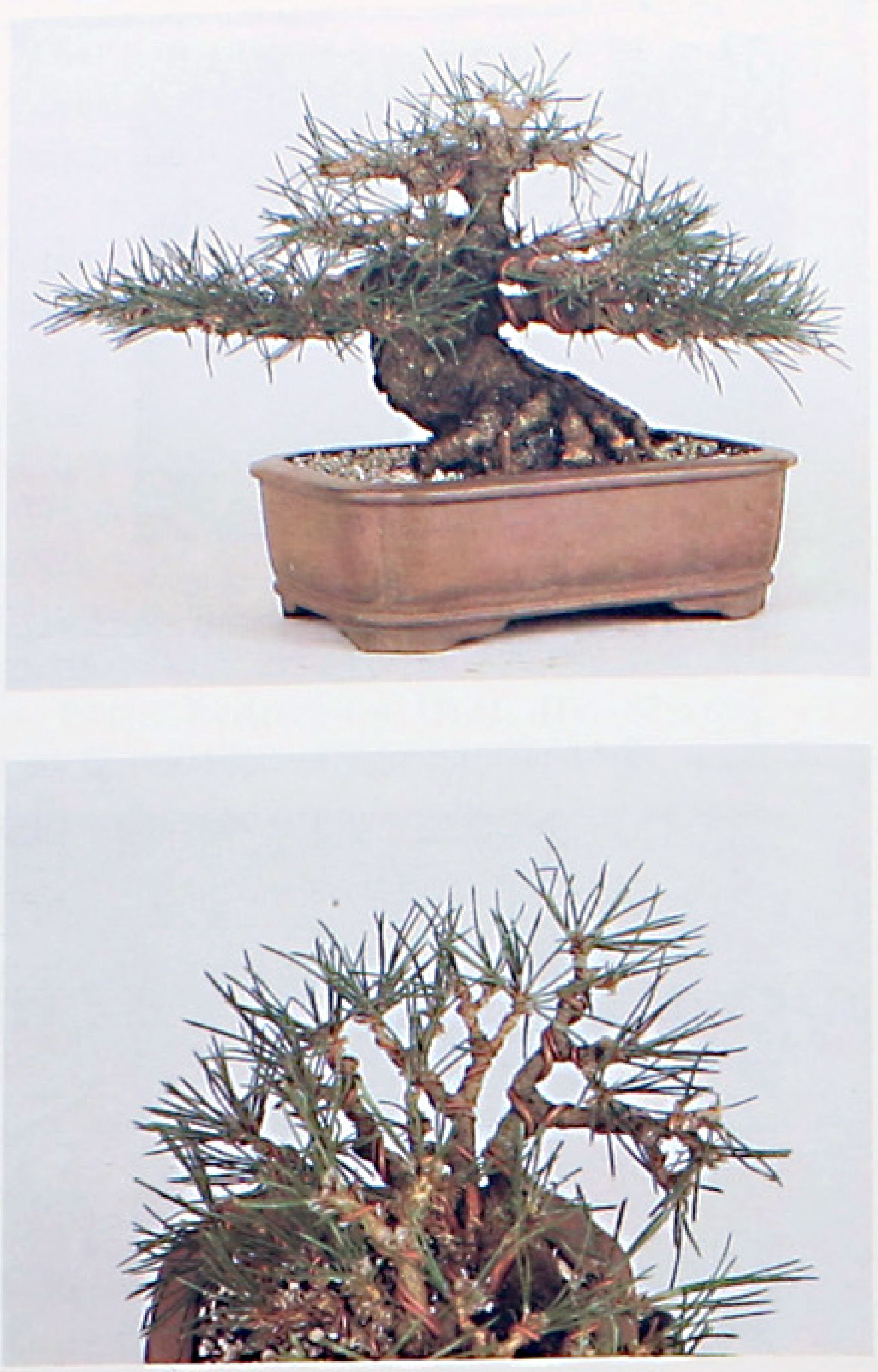
Thinning the apex



Pulling needles



Pruning and wiring



Late August, 1986

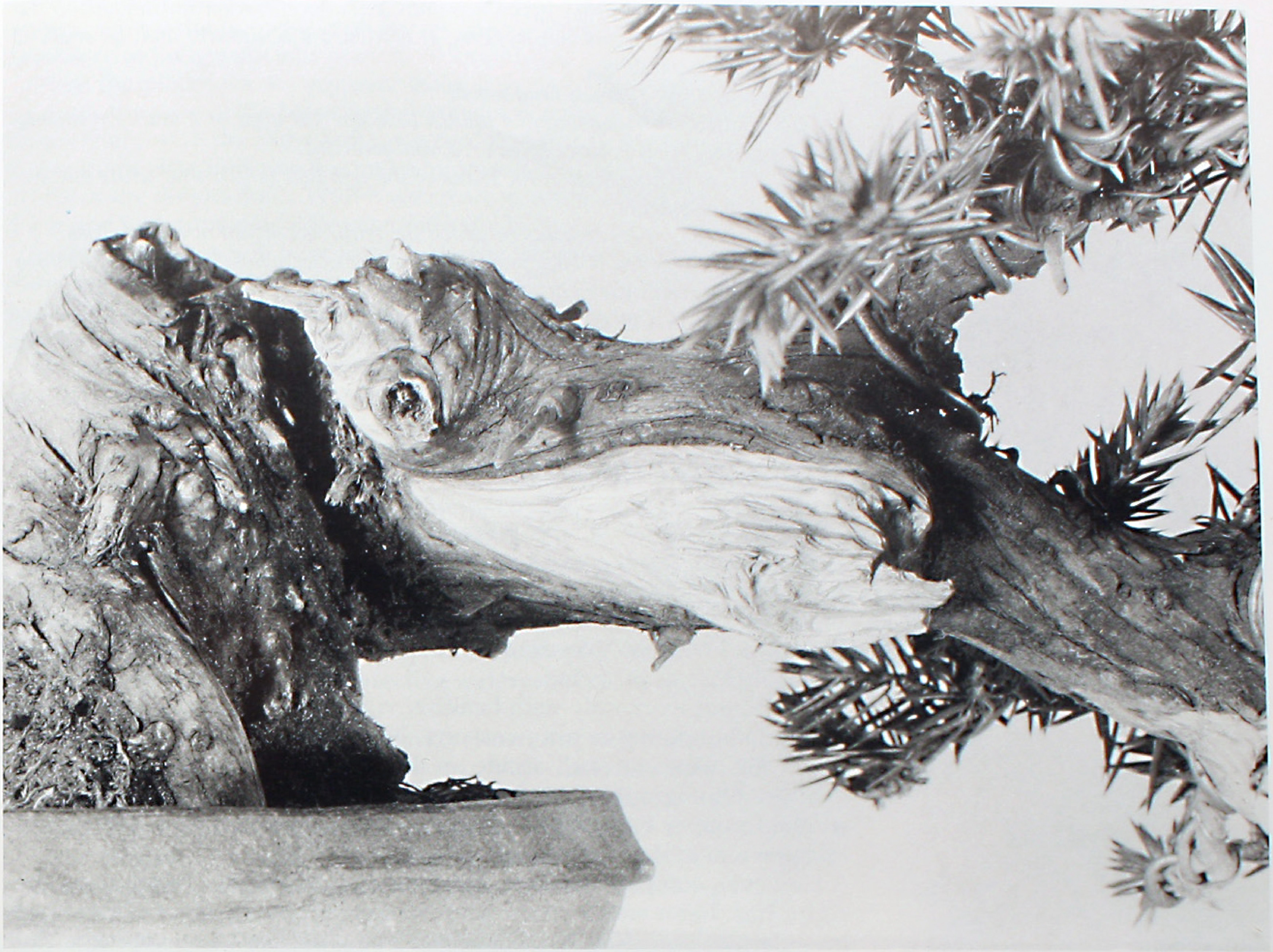
Once the Bonsai has been pruned and wired, we continue pinching the apex, which remains the strongest area.

Future appearance of the black pine Bonsai.

As long as the tree is vigorous, every year pinch it and remove the old needles, and every two or three years selectively remove buds.

Before pinching the apex

After pinching



Creation of dead wood

Author: Kusu Hara

What every grower of Bonsai tries to do is to capture in each of the trees in his collection the forces and whims of nature. Trees, continually subjected to the action of the elements, vary tremendously in shape depending very much on where they are located.

Perhaps the ones that impress me most are those that grow in gorges and on cliffs, for their trunks reflect a tenacity to survive, in spite of the unfavorable conditions of their environment. Many of them adopt cascade forms, or windswept looks, but the imprint of time and nature is present on all of them.

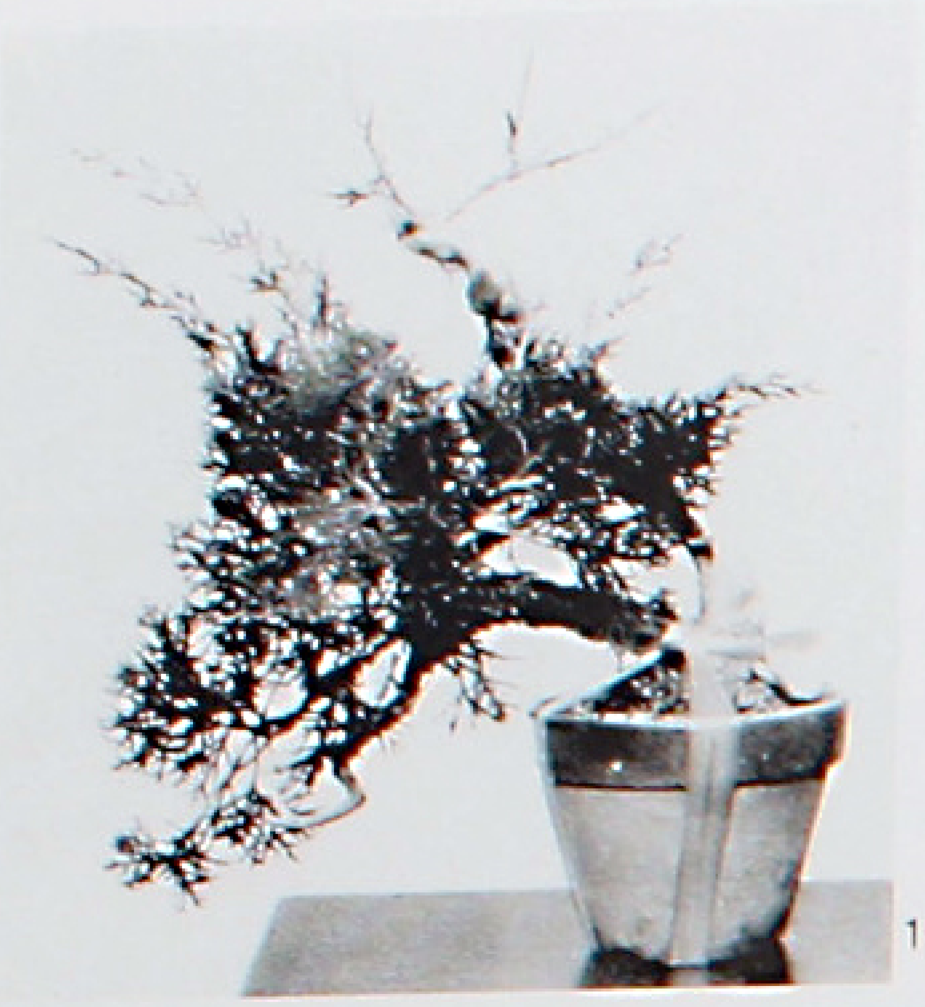
There was a time in Japan when enthusiasts could enjoy these specimens converted into Bonsai. But now, undoubtedly due to the abuse of collecting them, there are few examples to be found in nature of an appropriate size to be collected and enjoyed.

Therefore, we are now obliged to search for another kind of material and develop techniques appropriate to capture this effect of nature, with the added complexity of finding interesting trunks with which to work.

Most trees I referred to above have areas of dead wood, bare and white, that show the consequences of a strong wind, or of a rock slide, or of the effect of lightning or snow. These areas of dead wood [often called drift wood], together with the contortions and curves of the trunk, are what produce a tremendous impression of strength and tenacity, of power. To reproduce this effect on a nursery tree requires quite a bit of practice and a good deal of imagination:

We should practice carving wood learning the techniques of sculpture, and we must understand the horticultural limitations of the species to ensure its continued good health.

A very creative imagination is needed, or at least a vision gained through contemplating specimens of dead wood in nature.


1

Another indispensable condition is sufficient concentration to transmit to the tree our sentiments and impressions. It is almost a sculpture, and, as such, it needs to say something.

There are three types of dead wood:

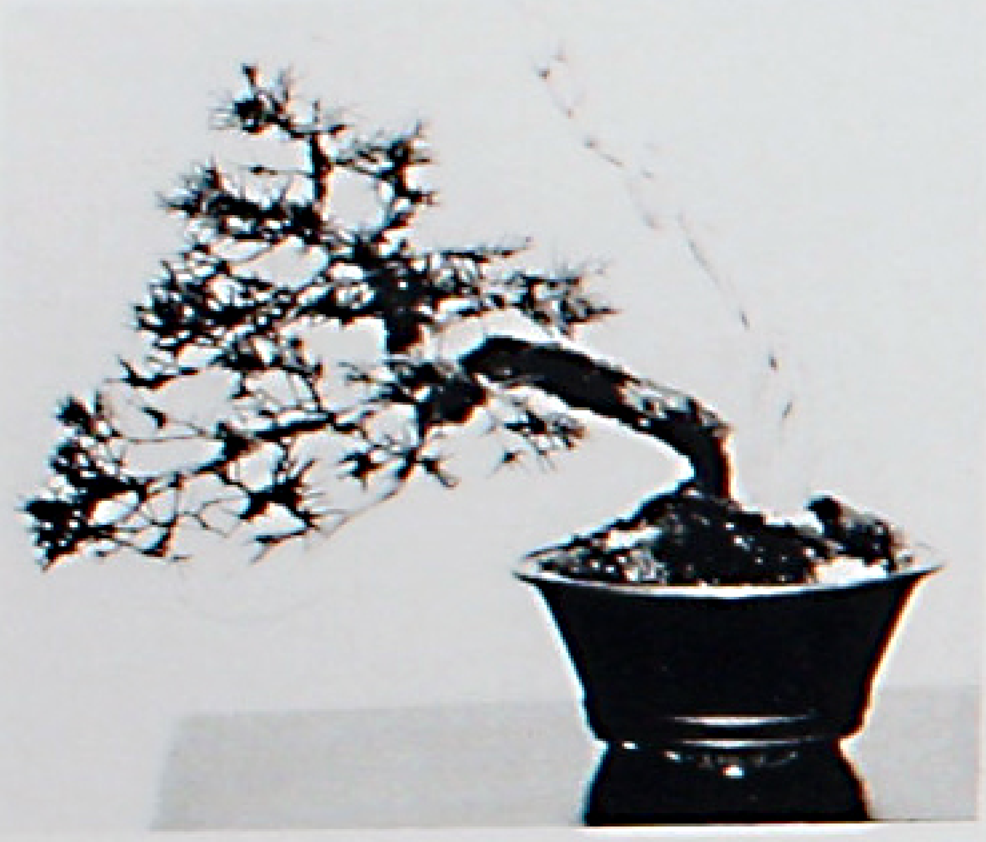
JIN: is that small portion of a branch (whether the apex or a stump resulting from pruning) that is bare, splintered, and bleached.

SHARI: is that portion of the trunk of the tree that is bare and white and exposed to the elements.

SABA MIKI: refers to areas in which the trunk is cracked or has cavities.

Clearly, dead wood is only present in those species whose wood is sufficiently hard to withstand inclement weather and the erosion of time without rotting.

Two species that meet this condition are the Juniperus rigida and the Juniperus chinensis (needle juniper and scaled juniper respectively), upon which we will now comment.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JUNIPERUS CHINENSIS

The scaled juniper adapts perfectly to the driftwood style, for its wood is flexible when green and hard and resistant once bare. The appropriate time for creation of dead wood is at the beginning of winter. At this time of year, the tree is almost dormant, but it has enough time to recover from the wound without "bleeding" much, because the pressure of the sap is not as intense as in spring.

3

We should work only with healthy, vigorous specimens, which have budded abundantly in prior seasons. Then, depending on the possibilities of the plant, we shall decide on the feeling we wish to impart.

In the photographs that accompany this text, for example, this twin-trunked juniper had no real character. When we look at it, we cannot imagine where it was growing.

However, compare it now to the second photograph. The trunk on the right has been made bare and sculpted, creating crevices and irregularities (we should never give a tree a polished appearance). The trunk on the left has been given a single line of movement through pruning and wiring, so that now it is evident that the tree moves to the left, whereas before the confusion of lines created a static impression.

Now the tree seems much older and, at the same time, healthier and stronger, precisely what we had aimed for.

4

JUNIPERUS RIGIDA

The needle juniper is as adaptable to these techniques as the chinensis; it buds back readily quickly developing new branches, but it is more difficult to thicken the trunk. Therefore, in Japan, one often starts with collected material, since it is not commonly cultivated as an ornamental plant for gardens.

The juniper that appears in the photographs was collected from a mountainside 5 years ago, and, since then, the only work that was done was to remove a thick branch in the place where there is now a patch of dead wood.

As you can see, it does not appear to be a particularly interesting or attractive tree, but the curve at the base of the trunk and its cascade fall give the tree some potential.

The first step consists of thinning the tree's crown, which was too tangled; to do this, we cut the branches that cross each other, as well as those that are growing straight up or straight down.

Next, with tweezers, we pluck all the needles from the base of the branches. In this way, the crown is free to let sun and air pass through, which is beneficial to the general health of the tree. When we finish pruning and pinching, we wire all the parts that need it. The reason for

1 Juniperus chinensis obtained from a nursery.

2 The same juniper after it had been shaped and planted in a Bonsai pot.

3 The ramification should be level with all secondary branches growing outwards.

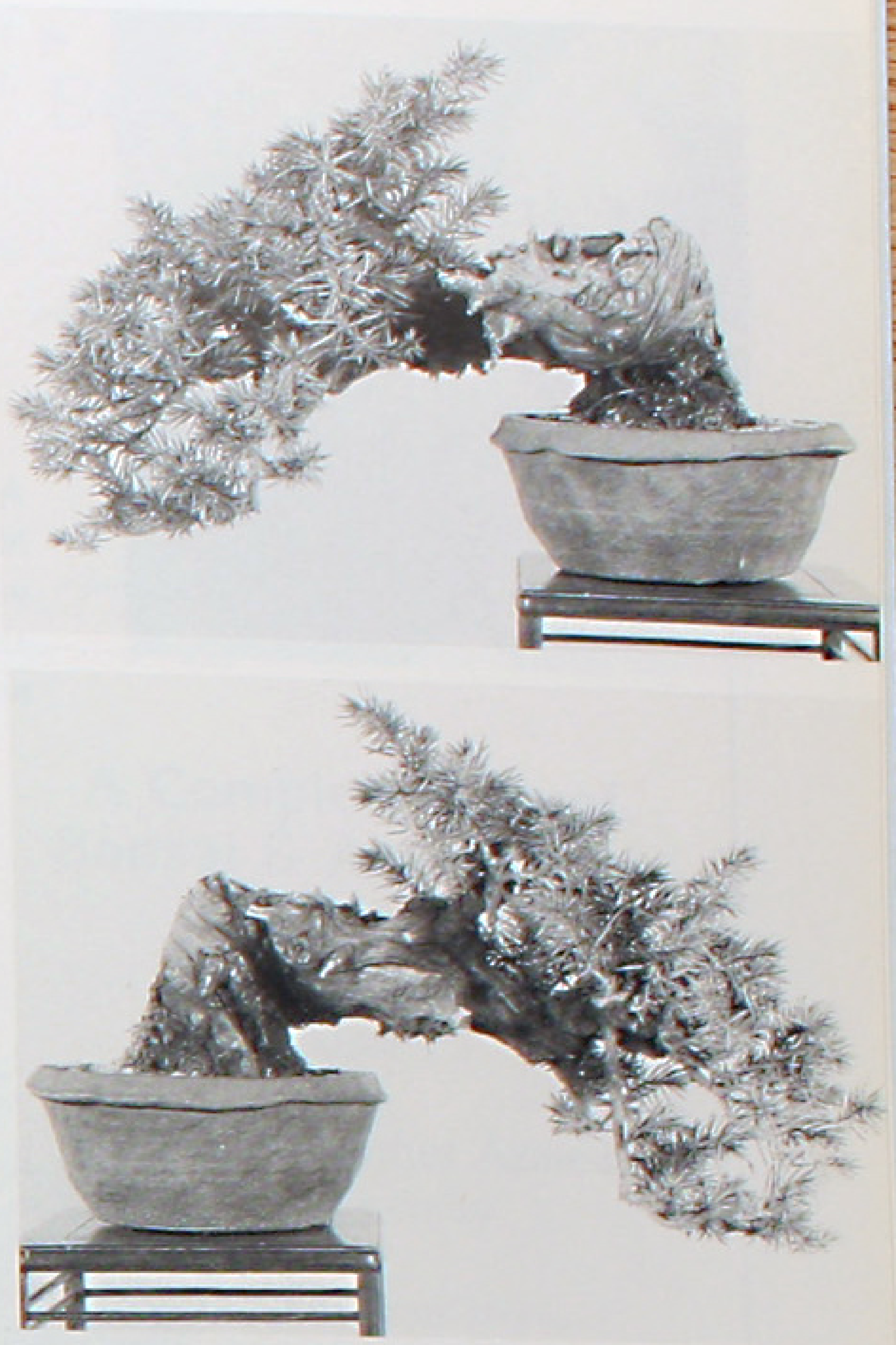
4 The upper branches before pruning and thinning.

wiring before creating the jin and shari is that we can better see the final design, where the branches will be, etc. Sometimes you may find it unnecessary to jin a particular branch, or vice versa.

Once the places we are going to make bare have been decided upon, we mark the base of the branch where the jin is going to end with a sharp knife. Then, with the same knife, we peel the branch, finishing the apex with a point. The final touch is given by an awl, like the one that is shown in one of the illustrations. With it we create grooves and crevices, so that the wood will appear as if it were naturally broken.

In the future, we will have to preserve the bare areas from rotting, and from insects. To do this, we use a mixture of lime and sulphur in equal parts diluted in water, known as "Jin liquid." This liquid, in addition, gives a more attractive white color to the dead wood.

The change from the first photograph is evident; now I can imagine the tree growing on a rocky ledge, looking down at the valley....



▲ These photographs show the front view and the back view of the needle juniper.

Editor's Notes on preserving deadwood

Dead wood is preserved and whitened by the application of lime sulphur (full strength Orthorix, for example). Often a few drops of black india ink or a little carbon black is added to reduce the stark appearance. A little white acrylic water color may also be added.

Using a small brush or cotton swab, apply the solution carefully to the dead wood area, avoiding the surrounding bark. Be careful not to drip on the roots; a protective waterproof cover at the base of the tree is a good precaution.

At first, the wood will be a dark yellow, but will fade to a more acceptable appearance in a few days. With time the effect will be lost and lime sulphur must be reapplied. This may be every six months or every year depending on the strength of the solution and your climate. As with everything in bonsai, be guided by your tree's needs and appearance; not by the date on the calendar.

The buds should remain free to grow without restraint.

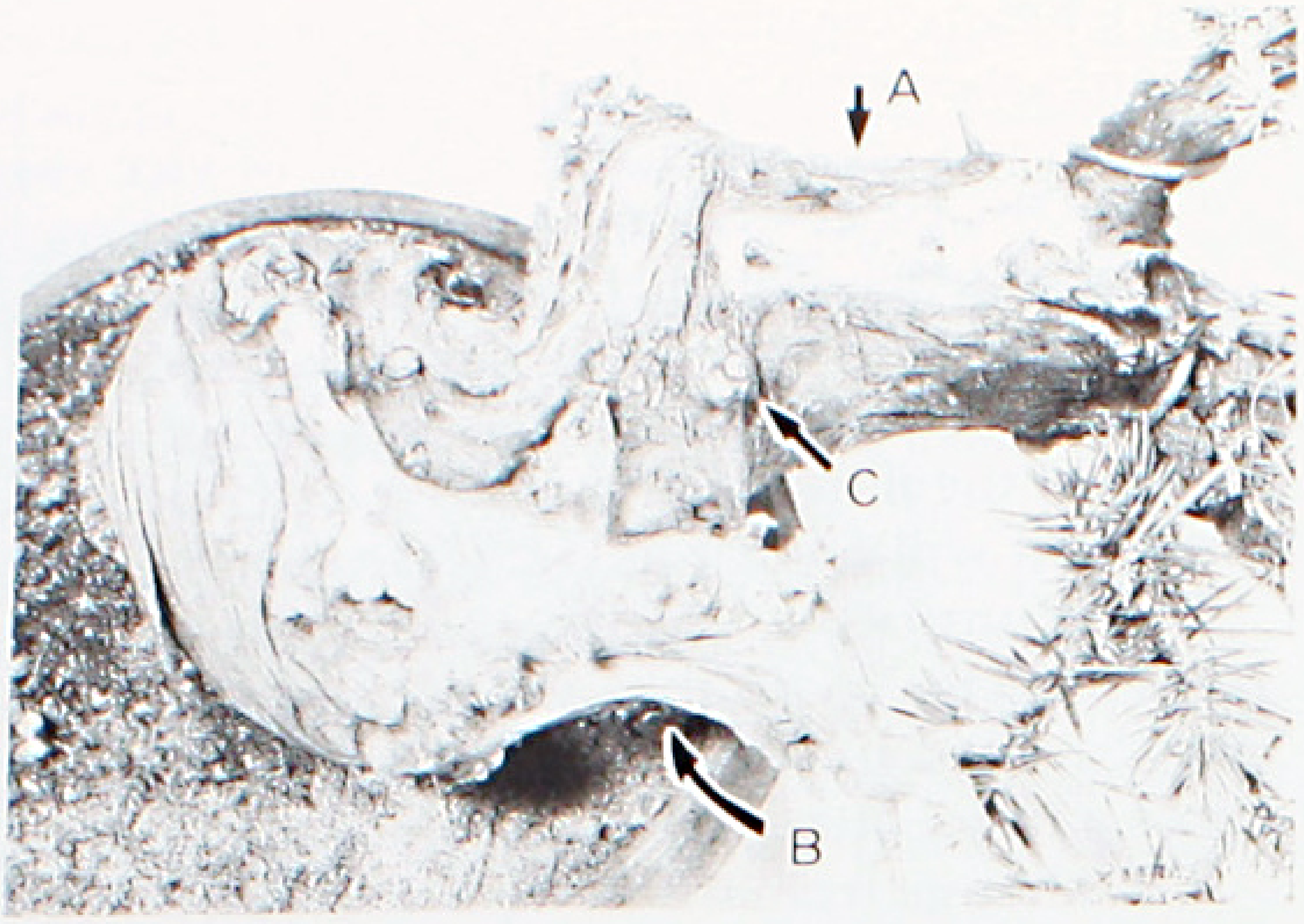
The branches are too dense and so need to be thinned.

After thinning and wiring, the apex is now evident.

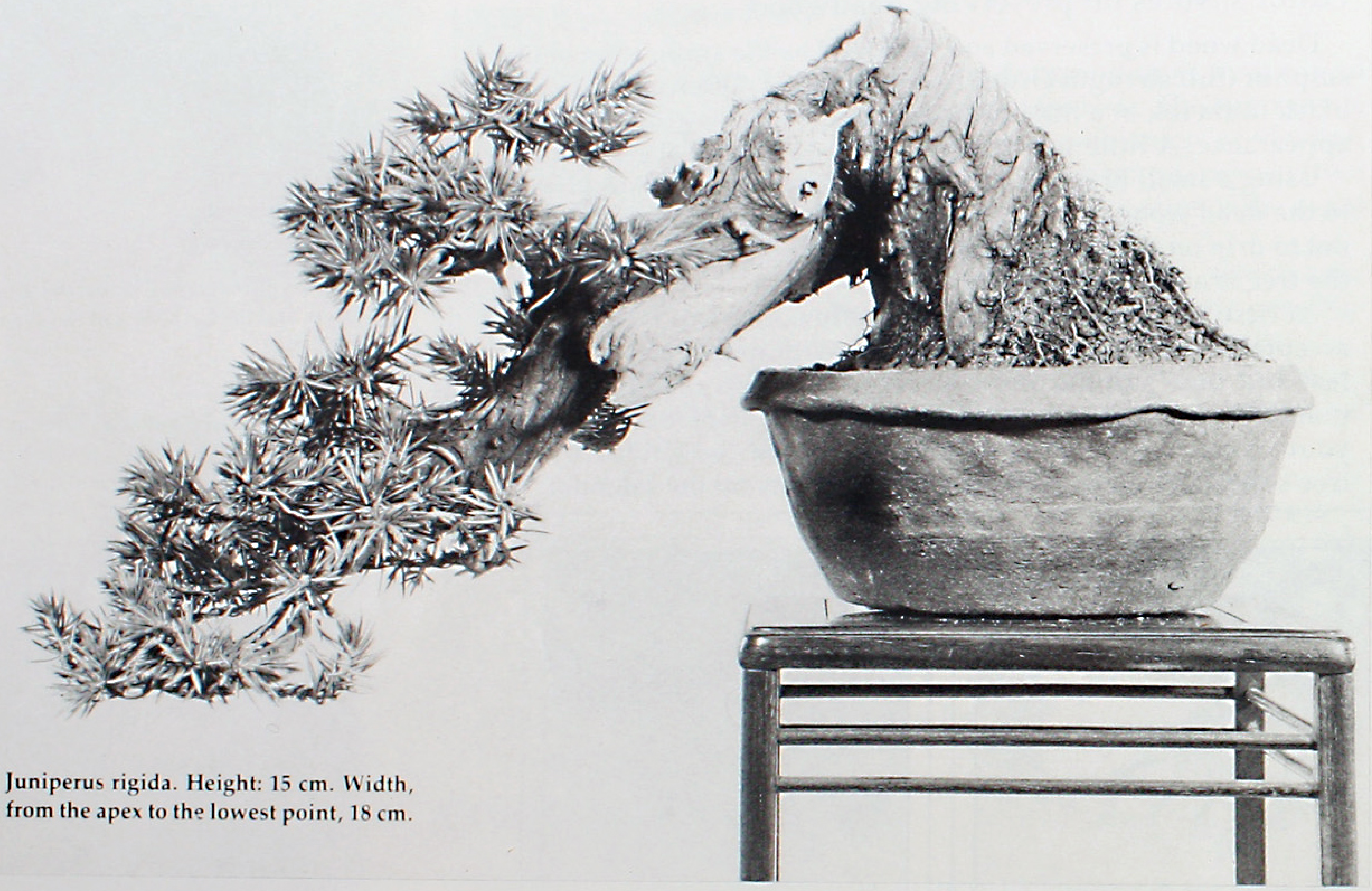
Here the apex was hidden by many other branches.

These illustrations show a close-up of the area in which shari is going to be created as well as pinching and the pulling of old needles. ▼

◀ To refine and create details, use an awl.



A. Artificially created shari. **B.** Natural shari. **C.** Dead zone, where the bark has been left alone so that the shari would not be too large. ▶



Juniperus rigida. Height: 15 cm. Width, from the apex to the lowest point, 18 cm.

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Restyling a trident maple into a semi-cascade style.

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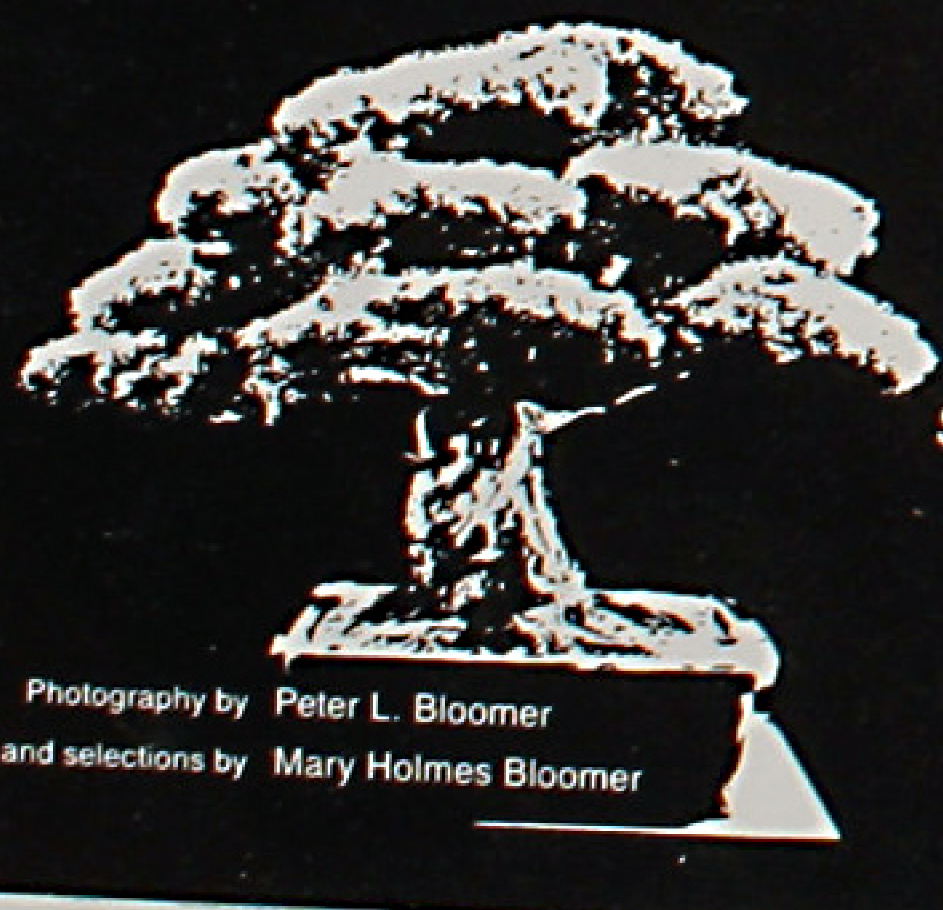
BASIC BOTANY

Review of the basic principles that are important to the grower of bonsai.



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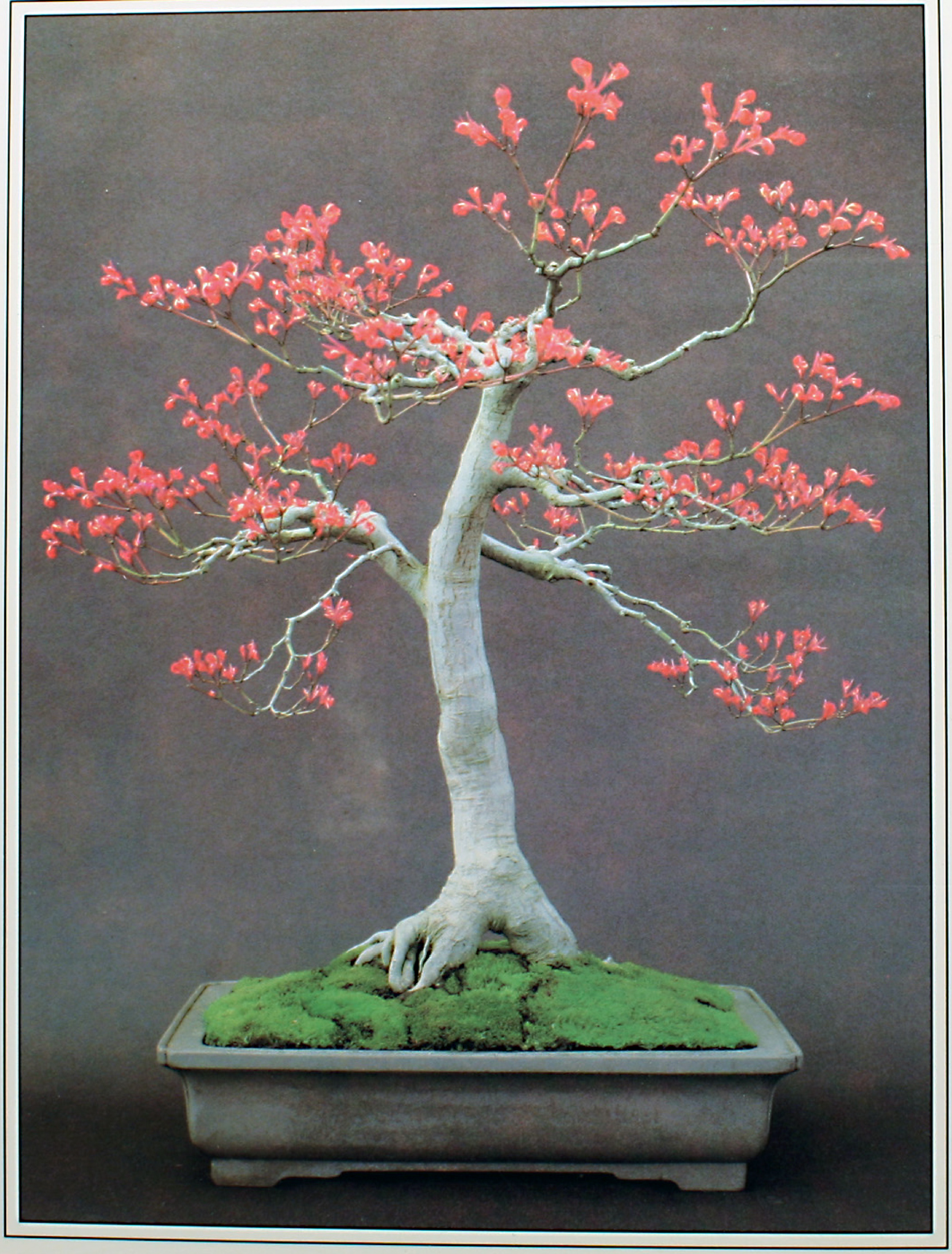

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